HITACHI

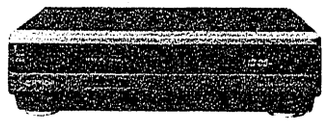
SERVICE MANUAL

TK | No. 3484E

VT-F350A
VT-F351A,AW

Technical Data

—VT-F350A—



—VT-F351A,AW —

SPECIFICATIONS

Recording:	Rotary two head Helical Scan Azimuth Recording
Video:	NTSC Color EIA Standard
Cassette:	VHS Type
Heads:	4 video heads 2 for SP, 2 for EP 2 Hi-Fi audio heads 1 Full track audio/video erase head 1 Combination head for control track, audio erase and audio record/play (3 heads/single housing)
Tape Speed:	33.35 mm/sec (SP), 16.67 mm/sec (LP) (playback only), 11.12 mm/sec (EP)
Tape Width:	12.7 mm
RF Output:	Channel 3 or Channel 4
RF Input:	UHF/VHF 75 ohm
Tuning Range:	VHF LOW CH, 2 ~ 6 (54 MHz – 88 MHz) VHF MID CH, A-5 ~ A-1 and A ~ I (90 MHz – 174 MHz) CATV VHF HIGH CH, 7 ~ 13 (174 MHz – 216 MHz) VHF SUPER CH, J ~ W (216 MHz ~ 300 MHz) CATV VHF HYPER CH, W+1 ~ W+28 (300 MHz – 468 MHz) CATV UHF CH, 14 ~ 69, W+29 ~ W+84 (470 MHz – 806 MHz)
Video Input:	1 – 2 Vp-p 75 ohm Unbalanced
Video Output:	1 Vp-p 75 ohm Unbalanced
Audio Input:	316 mV rms (–7.8 dB) 100 kohm
Audio Output:	316 mV rms (–7.8 dB) 600 ohm
Video Recording S/N:	Better than 46 dB (SP), Better than 40 dB (EP)
Horizontal Resolution:	240 lines (SP), 230 lines (EP)
Audio Response:	50 Hz – 10 kHz (SP), 100 Hz – 6 kHz (EP)
Audio S/N:	Better than 43 dB (SP), Better than 40 dB (EP)
Hi-Fi Audio	
Frequency Range:	20 Hz to 20 kHz
Dynamic Range:	90 dB
Wow and Flutter:	Less than 0.005% WRMS
Power Input:	AC 120V 60 Hz (For A) AC 110 – 240V, 50/60 Hz (For AW)
Power Consumption:	26W Nominal (For A) 18W Nominal (For AW)
Cabinet Size:	14-9/16"(W) x 3-1/2"(H) x 12-3/4"(D) 37.0(W) x 8.9(H) x 32.4(D) cm
Weight:	11.7 lbs (5.3 kg) (For A) 10.6 lbs (4.8 kg) (For AW)
Accessories:	1 – Coaxial cable 1 – Remote control unit 2 – Batteries 1 – Power plug adaptor (For AW)

Design and Specifications subject to change without notice.

VHS

This video deck is a VHS type video recorder. For proper operation, only the VHS type cassette must be used.

MANUALS RELATED TO THE VT-F350A

Name of Manual	Language	Manual No.	Chapters included
Technical Data	English	3484E	Chapters 1-6
Adjustment	French	3486F	Chapters 3,4
Technical Information	English	3485E	———

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

VIDEO CASSETTE RECORDER

July 1991 TOKAI WORKS

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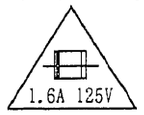
CAUTION AGAINST FUSE REPLACEMENT MARKING /
MESURE DE PRÉCAUTION À PRENDRE À PROPOS DES MARQUES DE FUSIBLE / :

CAUTION : FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE AND SAME RATING FUSE IN ACCORDANCE WITH THE FUSE SYMBOL MARKING.
MESURE DE PRÉCAUTION : POUR ASSURER À L'APPAREIL UNE PROTECTION PERMANENTE CONTRE TOUT RISQUE D'AMORÇAGE ÉLECTRIQUE, REMPLACER UNIQUEMENT PAR UN FUSIBLE DE MÊME TYPE ET DE MÊME CATÉGORIE CONFORMÉMENT AUX MARQUES INDIQUÉES SUR LE FUSIBLE.

* Example / * Exemple



This symbol indicates Fast Operating Type 1.6A, 125V Fuse.
Ce symbole se rapporte à un fusible à fusion rapide de type 1,6A, 125V

SAFETY PRECAUTIONS

NOTICE: Comply with all cautions and safety related notes located on or inside the cabinet and on the chassis.

1. When replacing a chassis in the instrument, all the protective devices must be put back in place, such as barriers, non-metallic knobs, adjustment and compartment covers/shields, isolation resistors/capacitors, etc.
2. When service is required, observe the original lead-dress. Extra precautions should be taken to assure correct lead dress in the high voltage circuit.
3. Always use the manufacturer's replacement components. Especially critical components as indicated on the circuit diagram should not be replaced by other manufacturer's. Furthermore, where a short-circuit has occurred, replace those components that indicate evidence of overheating.
4. Before returning an instrument to the customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock, and be sure that no protective device built into the instrument by the manufacturer has become defective or inadvertently defeated during servicing.

Therefore, the following checks should be performed for the continued protection of the customer and service technician.

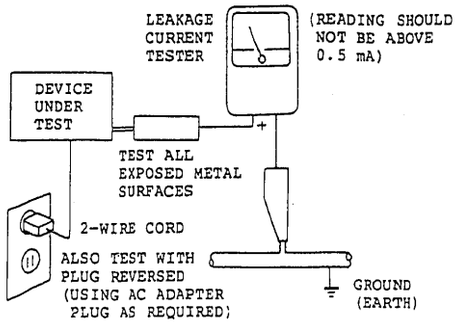
Leakage Current Cold Check

With the AC plug removed from the AC120V, 60Hz source, place a jumper across the two plug prongs. Turn the AC power switch on. Using an insulation tester (DC500V), connect one lead to the jumpered AC plug and touch the other lead to exposed metal parts (antennas, screwheads, metal overlays, control shafts, etc.), particularly any exposed metal part having a return path to the chassis. Exposed metal parts having a return path to the chassis should have a minimum resistor reading of 0.3 Mohm and a maximum resistor reading of 5 Mohm. Any resistor value below or above this range indicates an abnormality which requires corrective action. Exposed metal parts not having a return path to the chassis will indicate an open circuit.

Leakage Current Hot Check

Plug the AC line cord directly into a AC120V, 60 Hz outlet (do not use an isolation transformer for this check).

Turn the AC power switch on. Using a "Leakage Current Tester", measure for current from all exposed metal parts of the cabinet (antennas, screwheads, metal overlays, control shaft, etc.), particularly an exposed metal part having a return path to the chassis, to a known ground (earth) (water pipe, conduit, etc.). Any current measured must not exceed 0.5 mA.


LEAKAGE CURRENT TESTER
(READING SHOULD NOT BE ABOVE 0.5 mA)
DEVICE UNDER TEST
TEST ALL EXPOSED METAL SURFACES
2-WIRE CORD
ALSO TEST WITH PLUG REVERSED (USING AC ADAPTER PLUG AS REQUIRED)
GROUND (EARTH)

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE UNIT TO THE CUSTOMER.

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts have special safety-related characteristics. These are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.
Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which does not have the same safety characteristics as the HITACHI recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards. Product safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current HITACHI Service Manual. A subscription to, or additional copies of, HITACHI Service Manual may be obtained at a nominal charge from HITACHI SALES CORPORATION.

FOR CANADA

CAUTION AGAINST FUSE REPLACEMENT

FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE AND SAME RATING FUSE IN ACCORDANCE WITH THE FUSE SYMBOL LABEL.

The following is the indication of the fuse symbol label which is affixed adjacent to the fuse in the equipment.

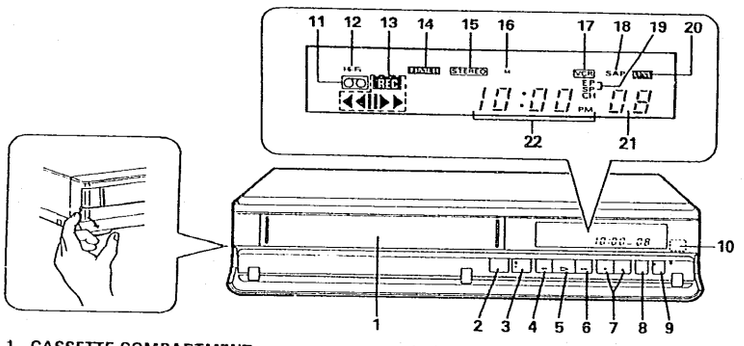
* Example

This symbol indicates Fast Operating Type 2A, 250V Fuse.

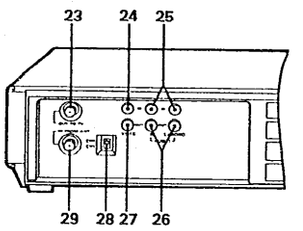
COMPARISON WITH PREVIOUS MODEL

	ITEM	VT-F350A/F351A	VT-F440A/F445A
FEATURES	REC /PLAY SYSTEM	VHS Hi-Fi	VHS Hi-Fi
	HQ (HIGH QUALITY)	USED	USED
	COMB FILTER	USED	USED
	NUMBER OF CHANNELS	181 CH	181 CH
	CHANNEL PRESET	F.S AUTO TUNING	F.S AUTO TUNING
	CHANNEL SELECT	UP/DOWN, 10 KEYS	UP/DOWN, 10 KEYS
	CATV/NOR. SELECT	YES (OSD) : CATV1/2	YES
	TIMER REC PROGRAM	8 PROGRAMS / 1 YEAR	8 PROGRAMS / 1 YEAR
	TIMER BACK-UP	ABOUT 30 MIN.	ABOUT 30 MIN.
	MODE DISPLAY	OSD / FL DISPLAY	OSD / FL DISPLAY
	TIMER PROGRAMMING	OSD (BY REMOTE CONTROL)	OSD (BY REMOTE CONTROL)
	CHANNEL TUNING	OSD (BY REMOTE CONTROL)	OSD (BY REMOTE CONTROL)
	CLOCK SETTING	OSD (BY REMOTE CONTROL)	OSD (BY REMOTE CONTROL)
	TV SELECT BUTTON	YES (BY REMOTE CONTROL)	YES (BY REMOTE CONTROL)
	IRT START BUTTON	NO	YES
	IRT LENGTH BUTTON	YES	YES
	COUNTER DISPLAY	OSD/FL DISPLAY	OSD/FL DISPLAY
	SCANAPLAY INDEX	YES	YES
	COUNTER GO-TO	YES	NO
	AUTO TRACKING	YES	YES
	LINE/TUNER SELECTOR	YES (BY REMOTE CONTROL)	YES
	PICTURE CONTROL	NO	NO
	PROBLEM GUIDE	YES	YES
	INSULATOR	YES	YES
	COUNTER REMAIN	NO	YES
	FRONT A/V INPUT	YES (VT-F351A/F351AW)	YES (VT-F445A)
	SYNCHRO EDIT JACK	YES (VT-F351A/F351AW)	YES (VT-F445A)
	HIGH SPEED REWIND	YES (VT-F351A/F351AW)	NO
	SPECTRA SONIC	NO	YES
	LEVEL METER	YES (VT-F351A/F351AW)	YES (VT-F445A/F440AW))
CHASSIS	BASIC CHASSIS TYPE	PZ (QUICK MECHANISM)	PZ (QUICK MECHANISM)
	HALF LOADING MECHANISM	PROVIDED	PROVIDED
	HEADS ON CYLINDER	DA4 HEADS + Hi-Fi	DA4 HEADS + Hi-Fi
	FLYING ERASE HEAD	NO	YES (VT-F445A)
	HEAD CLEANING MECHANISM	PROVIDED	PROVIDED
MAIN CONTROL ICs	VIDEO CIRCUIT		
	LUMINANCE / CHROMA PROCESS	HT7233E (IC201) HT7213 -F351AW ONLY- (IC201)	HT7255A (IC201) HT7245A -F440AW ONLY- (IC201)
	CCD 1H DELAY	CXL5507P (IC202)	MSM7400RS (IC203)
	AUDIO CIRCUIT		
	Hi-Fi AUDIO PROCESS	XRA7703KP (IC501)	XRA7703K1 (IC501)
	LINEAR AUDIO PROCESS	XRA7767A (IC401)	XRA7767AS (IC401)
	BASS BOOST AMP	————	RC4558D (IC1531, IC1532)
	MPX DECODE	SBX1637-01 (IC1801)	SBX1637-01 (IC1801)
	SERVO CIRCUIT		
	PHASE / SPEED CONT.	HD49747NT (IC601)	HD49741NT (IC601)
	CYLINDER MOTOR DRIVE	XRA6459P1 (IC1651)	XRA6459P1 (IC1651)
	TIMER / SYSTEM CONTROL CIRCUIT		
	SYSTEM CONTROL μP	M38174MX8-107FP (IC751)	μPD75516-126-389 (IC901)
	TIMER μP	M38174MX8-107FP (IC751)	HD404729A67S (IC751)
	LOADING MOTOR DRIVE	XRA6209U4 (IC753)	XRA6209U4 (IC753)
	EA-ROM	————	————
	OSD CIRCUIT		
	CG μP	M50458-084FP (IC1401)	μPD6450CX-703 (IC1401)
	PLL H.SYNC GEN	BA7046A (IC1441)	NJM2229S (IC2501)
	POWER SUPPLY CIRCUIT		
	5.6V REGULATOR	M5F7805 (IC851)	SWITCHING REGULATOR

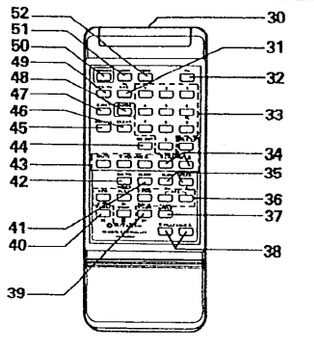
CONTROLS AND FEATURES (For VT-F350A)



1. **CASSETTE COMPARTMENT**
   Insert a cassette in through a door, and loading will be completed automatically.
   Note: Power is turned on automatically when the cassette is loaded.
2. **POWER BUTTON**
   Turn system power on and off.
3. **STOP/EJECT BUTTON**
   If this button is pressed, while the set is operating, the running of tape stops and all operating modes are cancelled (except for timer recording). The cassette is ejected, when this button is pressed again in STOP mode.
   Note: Power may be on or off when removing the cassette.
4. **REWIND BUTTON**
   Press to start rewind.
   Press this button during playback, and reverse playback picture at high speed can be seen.
5. **PLAY BUTTON**
   Press to start play.
6. **FAST FORWARD BUTTON**
   Press to activate fast forward.
   Press this button during playback, and forward playback picture at high speed can be seen.
7. **CHANNEL SELECT BUTTONS**
   Select the channels you wish to view or to record by pressing these buttons.
   And you can also select "LINE"* by pressing these buttons to record or watch the program input at the VIDEO IN and AUDIO IN.
   (*One channel position either higher or lower outside the range of your preset channels.)
8. **HEAD CLEANING BUTTON**
   Press this button to manually clean the video heads when the dirt cannot be removed by auto cleaning.
9. **RECORD/IRT BUTTON**
   Press to start recording.
10. **INFRARED RAY RECEIVING SECTION**
    Receives the infrared ray from remote control unit.
11. **TAPE-IN INDICATOR**
    Lights when cassette is loaded in the compartment.
12. **HI-FI INDICATOR**
    Lights when a Hi-Fi recorded tape is being played.
13. **VCR MODE INDICATOR**
    - REC appears during recording.
    - ◁◁ appears during the rewind mode.
    - ▷▷ appears during the fast-forward mode.
    - ▷ appears during the playback.
    - ▯▯ appears when the PAUSE button is pressed during record or play mode and disappears when the PAUSE button is pressed again.



14. **TIMER INDICATOR**
    Will light when turning power off after programming.
15. **STEREO INDICATOR**
    Lights when receiving a stereo broadcast.
16. **MEMORY INDICATOR**
    Appears when the DISPLAY button is pressed when the counter is displayed on TV screen or VCR's display. Rewind the tape with "M" lit, and the tape stops when the counter reads "0:00:00".
17. **VCR INDICATOR**
    Appears when the VCR is turned on or the VCR is in the playback mode.
18. **SAP INDICATOR**
    Some TV stations transmit a "Second Audio Program" (SAP). The SAP is normally used for a second language.
    This indicator lights when the VCR is tuned to SAP broadcast.
19. **TAPE SPEED INDICATORS**
20. **LINE INDICATOR**
    Lights when you select the LINE position by pressing the AVX button or CHANNEL select button. LINE position is used to record or watch the program input at the VIDEO IN and AUDIO IN.
21. **CHANNEL INDICATOR**
22. **CLOCK DISPLAY**
    Shows the clock and tape counter.
23. **ANTENNA OUTPUT**
    Connect this terminal to the antenna terminal on the back of the TV.

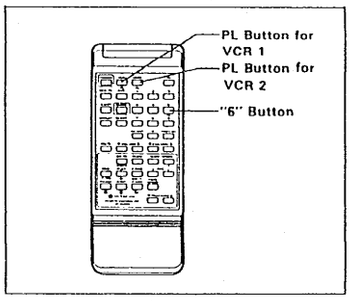


24. **VIDEO IN**
    Receives video signal from a video camera or another VCR.
25. **AUDIO IN**
    Receive audio signals from a stereo system or another VCR. AUDIO IN (L) handles the left-channel stereo sound or monaural sound. If you connect an audio source to only AUDIO IN (L), the same sound is recorded on Hi-Fi tracks (L) and (R) in monaural.
26. **AUDIO OUT**
    For a connection to a monitor or another VCR.
27. **VIDEO OUT**
    For connection to monitor TV.
28. **RF CONVERTER SWITCH**
    Set this switch to whichever channel (CH3 or CH4) is unused in your area.
29. **ANTENNA INPUT**
    Connect the UHF and/or VHF antenna to this terminal.
30. **SIGNAL TRANSMISSION WINDOW**
    Transmits an invisible light beam (infrared) from the remote control unit to the VCR.
31. **AVX BUTTON**
    Press to select tuner position to record or view an off-the-air TV program (through the VCR's built-in tuner) or the "LINE" position to record or view the program input through the video and audio line input jacks.

32. **TV BUTTON**
    First press this button when operating your TV with this remote control, and then press the button which corresponds to the function you want.
33. **NUMBER BUTTONS "0" THROUGH "9"**
    Select any channel (whether or not it is in the "Tuner Scan List") by pressing two buttons. (Press "0" and then "8" for channel 8.)
    The number buttons are also used for setting the clock and programming the timer.
34. **CHANNEL SELECT BUTTONS**
    Same as the buttons on the VCR.
35. **SLOW SPEED BUTTONS**
    During slow playback the slow speed can be adjusted by pressing the SLOW SPEED button.
36. **VCR CONTROL BUTTONS**
    These buttons (except for "REC" buttons) function same as the buttons on your VCR.
    Note: The REC buttons must be pressed simultaneously to start recording.
37. **TAPE SPEED SELECT BUTTON**
    Recording time using Cassette tape T-160:
    EP: 8 hours SP: 2.6 hours
    Notes:
    - Playback speed automatically corresponds with recorded speed.
    - This VCR cannot record in LP mode, but can play LP recorded tapes.
38. **TRACKING CONTROL BUTTONS**
    To minimize noise in playback.
39. **FRAME ADVANCE BUTTON**
    Press to view tape one frame at a time.
    Operates only after PAUSE button has been pressed.
40. **PAUSE BUTTON**
    Press to pause during recording or playback.
41. **SLOW BUTTON**
    Allows you to view a picture at slow speed.
42. **GO-TO/INDEX BUTTON**
    Press this button to search for the scene you want to view using the counter GO-TO or INDEX feature.
43. **TV CONTROL BUTTONS**
    Used for controlling the TV.
44. **100/ENT BUTTON**
    Used to select TV or CATV channels.
    Press "100", "2", "3" in this order to select channel 123. Press "100", "0" and "5" for channel 105.
45. **DISPLAY BUTTON**
    1st Press .... Calls up the mode display on TV screen.
    2nd Press (before display disappeaars) .... The display on TV screen disappears except for "Linear Time Counter".
    Also changes the VCR's display from the clock to the counter.
    3rd Press .... The counter memory "M" appears on TV screen and in VCR's display.
    4th Press .... Clears the display on TV screen. Also changes the VCR's display from the counter to the clock.
46. **CLEAR BUTTON**
    Used for programming the timer.
    And also used for counter reset button.
47. **EJECT BUTTON**
    When this button is pressed in modes other than recording, the tape stops, and the cassette is ejected.
48. **INTELASCAN GUIDE BUTTON**
    Press this button to use the Intelascan feature.
49. **VCR/TV SELECT BUTTON**
    Selects the signal to be viewed.
    The VCR indicator comes on when the unit is in VCR mode and the signal received by the VCR is displayed on the TV screen.
    With the switch in the TV position (indicator light off) the broadcast signal is received directly by your TV set. When the VCR power is turned off, the VCR automatically switches to "TV".
50. **POWER BUTTON**
    Press to turn VCR on. Press again to turn VCR off.
51. **VCR1 BUTTON**
    First press this button when operating the VCR with this remote control and then press the button which corresponds to the function you want.
52. **VCR 2 BUTTON**
    Press this button when using another Hitachi VCR and operating the remote control provided to control the two VCRs.

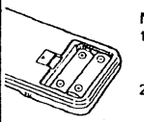
■ PL (Parent Lock) Button

When this button and button "6" are pressed simultaneously, the buttons on the front panel of the VCR cannot be operated. This prevents children from operating the VCR without their parents approval.
To release the lock, press the PL button and button "6" simultaneously or press the POWER button of the remote control.
You can select the VCR 1 or VCR 2 remote mode with this VCR. If you press the VCR 2 (PL) button and button "6" simultaneously when VCR 2 is selected, for example, the VCR cannot be operated by the operation buttons on the VCR.



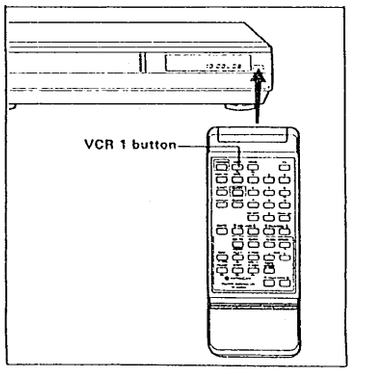
■ USING THE REMOTE CONTROL UNIT

HOW TO INSTALL BATTERIES



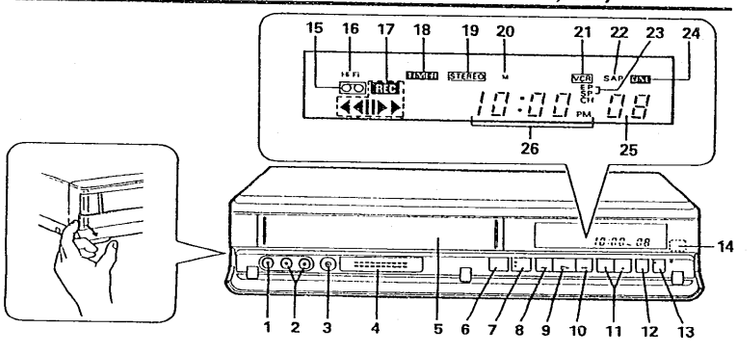
NOTES:
1. Be sure to install two "AA" size batteries before use.
2. Be aware of the polarity.

Aim the remote control at the receiver on the front panel of the VCR.

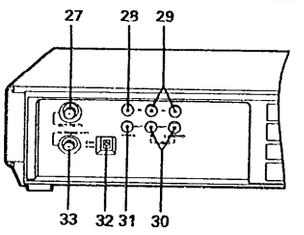


NOTES:
1. If the range is short, try new batteries.
2. An object in between the VCR and remote control unit may block the invisible light beam and operation will not be possilble.
3. If you cannot operate the VCR with this remote control, first press the VCR 1 button and then press the button which corresponds to the VCR function you want.

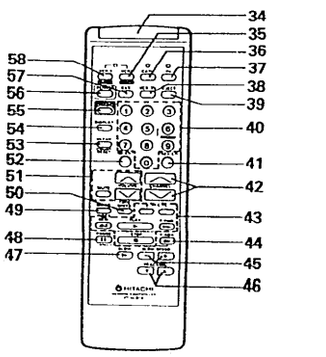
CONTROLS AND FEATURES (For VT-F351A,AW)



1. **VIDEO IN**
   Receives video signal from a video camera or another VCR.
2. **AUDIO IN**
   Receives audio signals from a stereo system or another VCR.
   Notes:
   - There are AUDIO IN/VIDEO IN jacks on both the front and rear panels. The front jacks have priority over the rear jacks. Do not connect any equipment to the jacks on the front panel when using the AUDIO IN/VIDEO IN jacks on the rear panel.
   - AUDIO IN (L) on the front or the rear handles the left-channel stereo sound or monaural sound. If you connect an audio source to only AUDIO IN (L), the same soud is recorded on Hi-Fi tracks (L) and (R) in monaural.
3. **EDIT IN/OUT JACK**
   This jack allows you to connect selected models of VCR's and video camera using optional synchro edit cables. Refer to page 38 for details.
4. **LEVEL METER**
   Shows the input level of each audio channel during recording and the recorded levels during playback.
5. **CASSETTE COMPARTMENT**
   Insert a cassette in through a door, and loading will be completed automatically.
   Note: Power is turned on automatically when the cassette is loaded.
6. **POWER BUTTON**
   Turn system power on and off.
7. **STOP/EJECT BUTTON**
   If this button is pressed, while the set is operating, the running of tape stops and all operating modes are cancelled (except for timer recording). The cassette is ejected, when this button is pressed again in STOP mode.
   Note: Power may be on or off when removing the cassette.
8. **REWIND BUTTON**
   Press to start rewind.
   Press this button during playback, and reverse playback picture at high speed can be seen.
9. **PLAY BUTTON**
   Press to start play.
10. **FAST FORWARD BUTTON**
    Press to activate fast forward.
    Press this button during playback, and forward playback picture at high speed can be seen.
11. **CHANNEL SELECT BUTTONS**
    Select the channels you wish to view or to record by pressing these buttons.
    And you can also select "LINE"* by pressing these buttons to record or watch the program input at the VIDEO IN and AUDIO IN.
    (*One channel position either higher or lower outside the range of your preset channels.)



12. **HEAD CLEANING BUTTON**
    Press this button to manually clean the video heads when the dirt cannot be removed by auto cleaning.
13. **RECORD/IRT BUTTON**
    Press to start recording.
14. **INFRARED RAY RECEIVING SECTION**
    Receives the infrared ray from remote control unit.
15. **TAPE-IN INDICATOR**
    Lights when cassette is loaded in the compartment.
16. **Hi-Fi INDICATOR**
    Lights when a Hi-Fi recorded tape is being played.
17. **VCR MODE INDICATOR**
    - [REC] appears during recording.
    - ◁◁ appears during the rewind mode.
    - ▷▷ appears during the fast-forward mode.
    - ▷ appears during the playback.
    - ▯▯ appears when the PAUSE button is pressed during record or play mode and disappears when the PAUSE button is pressed again.
18. **[TIMER] INDICATOR**
    Will light when turning power off after programming.
19. **[STEREO] INDICATOR**
    Lights when receiving a stereo broadcast.
20. **MEMORY INDICATOR**
    Appears when the DISPLAY button is pressed when the counter is displayed on TV screen or VCR's display. Rewind the tape with "M" lit, and the tape stops when the counter reads "0:00:00".



21. **[VCR] INDICATOR**
    Appears when the VCR is turned on or the VCR is in the playback mode.
22. **SAP INDICATOR**
    Some TV stations transmit a "Second Audio Program" (SAP). The SAP is normally used for a second language.
    This indicator lights when the VCR is tuned to SAP broadcast.
23. **TAPE SPEED INDICATORS**
24. **[LINE] INDICATOR**
    Lights when you select the LINE position by pressing the AVX button or CHANNEL select button. LINE position is used to record or watch the program input at the VIDEO IN and AUDIO IN.
25. **CHANNEL INDICATOR**
26. **CLOCK DISPLAY**
    Shows the clock and tape counter.
27. **ANTENNA OUTPUT**
    Connect this terminal to the antenna terminal on the back of the TV.
28. **VIDEO IN**
29. **AUDIO IN**
30. **AUDIO OUT**
    For a connection to a monitor or another VCR.
31. **VIDEO OUT**
    For connection to monitor TV.

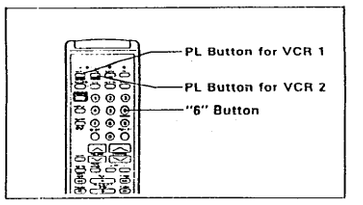
32. **RF CONVERTER SWITCH**
    Set this switch to whichever channel (CH3 or CH4) is unused in your area.
33. **ANTENNA INPUT**
    Connect the UHF and/or VHF antenna to this terminal.
34. **SIGNAL TRANSMISSION WINDOW**
    Transmits an invisible light beam (infrared) from the remote control unit to the VCR.
35. **VCR 2 BUTTON**
    Press this button when using another Hitachi VCR and operating the remote control provided to control the two VCRs.
36. **CATV BUTTON**
    First press this button when operating your Cable Converter with this remote control, and then press the button which corresponds to the function you want.
37. **TV BUTTON**
    First press this button when operating your TV with this remote control, and then press the button which corresponds to the function you want.
38. **VCR/TV SELECT BUTTON**
    Selects the signal to be viewed.
    The VCR indicator comes on when the unit is in VCR mode and the signal received by the VCR is displayed on the TV screen. With the switch in the TV position (indicator light off) the broadcast signal is received directly by your TV set. When the VCR power is turned off, the VCR automatically switches to "TV".
39. **EJECT BUTTON**
    When this button is pressed in modes other than recording, the tape stops, and the cassette is ejected.
40. **NUMBER BUTTONS "0" THROUGH "9"**
    Select any channel (whether or not it is in the "Tuner Scan List") by pressing two buttons. (Press "0" and then "8" for channel 8.)
    The number buttons are also used for setting the clock and programming the timer.
41. **PREV CH BUTTON**
    Used to control the TV.
    You need not press the TV button before pressing this button.
42. **CHANNEL SELECT BUTTONS**
    Same as the buttons on the VCR.
43. **VCR CONTROL BUTTONS**
    These buttons (except for "REC" buttons) function same as the buttons on your VCR.
    Note: The REC buttons must be pressed simultaneously to start recording.
44. **FRAME ADVANCE BUTTON**
    Press to view tape one frame at a time.
    Operates only after PAUSE button has been pressed.
45. **SLOW SPEED BUTTONS**
    During slow playback the slow speed can be adjusted by pressing the SLOW SPEED button.
46. **TRACKING CONTROL BUTTONS**
    To minimize noise in playback.
47. **SLOW BUTTON**
    Allows you to view a picture at slow speed.
48. **PAUSE BUTTON**
    Press to pause during recording or playback.
49. **GO-TO/INDEX BUTTON**
    Press this button to search for the scene you want to view using the counter GO-TO or INDEX feature.
50. **TAPE SPEED SELECT BUTTON**
    Recording time using Cassette tape T-160:
    EP: 8 hours SP: 2.6 hours
    Notes:
    - Playback speed automatically corresponds with recorded speed.
    - This VCR cannot record in LP mode, but can play LP recorded tapes.
51. **TV CONTROL BUTTONS**
    Used for controlling the TV.
52. **100/ENT BUTTON**
    Used to select TV or CATV channels.
    Press "100", "2", "3" in this order to select channel 123. Press "100", "0" and "5" for channel 105.
53. **CLEAR BUTTON**
    Used for programming the timer.
    And also used for counter reset button.
54. **DISPLAY BUTTON**
    1st Press .... Calls up the mode display on TV screen.
    2nd Press (before display disappeaars) .... The display on TV screen disappears except for "Linear Time Counter".
    Also changes the VCR's display from the clock to the counter.
    3rd Press .... The counter memory "M" appears on TV screen and in VCR's display.
    4th Press .... Clears the display on TV screen. Also changes the VCR's display from the counter to the clock.
55. **INTELASCAN GUIDE BUTTON**
    Press this button to use the Intelascan feature.
56. **POWER BUTTON**
    Press to turn VCR on. Press again to turn VCR off.
57. **AVX BUTTON**
    Press to select tuner position to record or view an off-the-air TV program (through the VCR's built-in tuner) or the "LINE" position to record or view the program input through the video and audio line input jacks.
58. **VCR1 BUTTON**
    First press this button when operating the VCR with this remote control and then press the button which corresponds to the function you want.

■ PL (Parent Lock) Button

When this button and button "6" are pressed simultaneously, the buttons on the front panel of the VCR cannot be operated. This prevents children from operating the VCR without their parents approval.

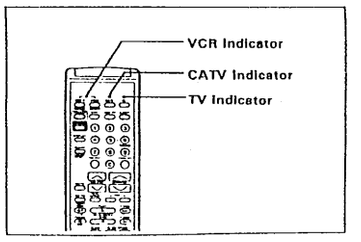
To release the lock, press the PL button and button "6" simultaneously or press the POWER button of the remote control.

You can select the VCR 1 or VCR 2 remote mode with this VCR. If you press the VCR 2 (PL) button and button "6" simultaneously when VCR 2 is selected, for example, the VCR cannot be operated by the operation buttons on the VCR.



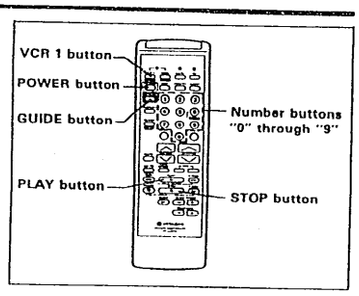
■ VCR/CATV/TV Indicators

This remote control can operate the VCR, TV and Cable Converter. When a button such as "0" — "9", "POWER" used in common to command the VCR, TV and Cable Converter is pressed, the corresponding indicator lights to show which mode the remote control is in. When a button is pressed and the TV indicator lights, you can operate the TV.



CHANNEL TUNING

The automatic programming feature makes it easy and convenient to program the TV station into the tuner's memory.
Automatic programming is usually a "one-time" procedure, but you will need to repeat it if you move to a location that has different channels, or if the power is interrupted for about 30 minutes.



1. Turn on the power of both VCR and TV.
2. Be sure that the TV is set to the video channel (channel 3 or 4).
3. Aim the remote control unit at the receiver on the front panel of the VCR.

4. Press the GUIDE button until the "MENU", as illustrated, appears on the TV screen.
   NOTE: If the menu does not appear when the GUIDE button is pressed, press the VCR 1 button and then the GUIDE button.

Original menu

5. Press button "1" for channel setting.

6. Press button "1" to select "NORMAL", "CATV1" or "CATV2". If your VCR is connected to a home antenna system, select "NORMAL"; select "CATV1" when your VCR is connected to a cable antenna. Switching is performed between "NORMAL", "CATV1" and "CATV2" on the TV screen every time button "1" is pressed.
   NOTE: Usually select "CATV1" when your VCR is connected to a cable antenna. "CATV2" is to be selected in special cases.

7. Press "2" button.
   The tuner will automatically cycle through all available channels in the area and place them in the tuner's memory. It takes about 2 — 3 minutes.
   The channel number will stop changing when the tuner is finished cycling. Programming is now completed.
   You can select the active channels by pressing the CHANNEL select buttons.

■ Eliminating unwanted preset channels

You may want to have only a few favorite channels in the tuner's memory so you can select them more quickly with the CHANNEL select button. Occasionally automatic programming may include a vacant channel in the tuner's memory if there happened to be some sort of "noise" or "stray signal" on the channel when the tuner was programmed. This procedure explains how to delete any unwanted channels from the tuner's memory.

1. Follow steps 1 through 5 of "Channel Tuning".

2. Press "3". The "menu", as illustrated, will appear on the TV screen.

3. Select the channel number by pressing buttons "0" through "9". (Press "0" and then "8" for channel 8.)
   Press the PLAY button to add channels and the STOP button to erase channels.
   Perform the same procedure to add or erase other channel numbers.
   NOTE: Erased channels cannot be selected by the CHANNEL button, but can be selected by buttons "0" through "9".
4. Press GUIDE button to return to the TV screen.

NOTE: There are some areas where channels cannot be switched when "CATV1" is selected. In this case, select "CATV2" as in step 6 on the previous page.

Your VCR is capable of receiving "off-the-air" TV channels (VHF 02 — 13, UHF 14 — 69) and CATV channels 01 — 125, a total of 181 channels*.

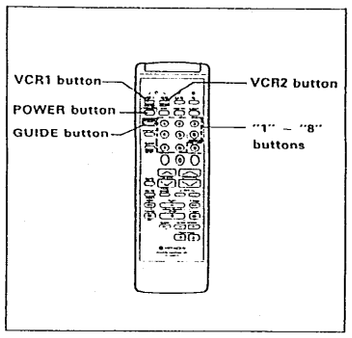
* You can receive channels 02 — 13 on both "off-the-air" and "cable" channels. Therefore, the total number of channels including "off-the-air" and "cable" channels is 181 channels (12 + 56 + 125 − 12 = 181).

■ Adding channels to the tuner's memory

You may have deleted a channel from the tuner's memory and want to put it back. Occasionally automatic programming may "miss" an active channel because the signal is very weak or because the channel happened to be "off the air" when the tuner was programmed. Use this procedure to add any channel in the memory.

VCR FUNCTION SETTING

You can change the VCR mode as required using the "INTELASCAN GUIDE MENU".



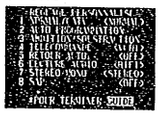
1. Turn on the power of both the VCR and TV.
2. Be sure that the TV is set to the video channel (3 or 4).
3. Point the remote control unit at the receiver on the front panel of the VCR.
4. Press the GUIDE button until the "menu", as illustrated, will appear on the TV screen.

5. Press button "1".

- The VCR function set menu will appear. Press buttons "4" through "8" to select the required function.

■ REMOTE MODE VCR1/VCR2

Press "4" ➡ to change



VCR 1: Normally select this "VCR1".
VCR 2: Select "VCR2" when you are using another Hitachi VCR and operate the two VCRs using the remote control unit provided with this VCR.

Note: After you have selected "VCR2", press the VCR2 button and then perform the following operations; otherwise, the VCR does not accept commands. To return to "VCR1" after you have selected "VCR2", press the VCR2 button first.

■ MOVIE RETURN ON/OFF

Press "5" ➡ to change

ON: When a cassette (with erase prevention tab removed) is loaded, playback starts automatically. When the tape reaches the end, it will stop automatically and will rewind to its start. Then the cassette will be ejected automatically.
Note: This function also rewinds the tape automatically when it detects a non-recorded section lasting about 30 seconds or more.

OFF: This function does not operate.

■ PLAY SOUND SELECTION

Press "6" ➡ to change

You can switch the sound output from the AUDIO OUT jack during playback.

- Hi-Fi: Hi-Fi sound is played back with a Hi-Fi tape. The linear sound is played back with a non-Hi-Fi tape. Normally, select "Hi-Fi".
- LINEAR: The linear sound is played even when Hi-Fi sound is recorded on the tape.

■ STEREO/MONO SELECTION

Press "7" ➡ to change

Your VCR is capable of recording stereo sound from TV stations transmitting stereo in your area. All you have to do is to make sure the STEREO indicator is displayed in the VCR display as the VCR can receive stereo broadcasts. Normally this function can be left in the STEREO mode. Your VCR will then automatically record either stereo or monaural sound — whatever is broadcast.
In some fringe viewing areas, however, the stereo signal may not be strong enough for quality reception. The signal may drift or become noisy. Should that occur, change the STEREO/MONO function to the MONO mode to receive clearer, cleaner sound.

■ SAP ON/OFF SELECTION

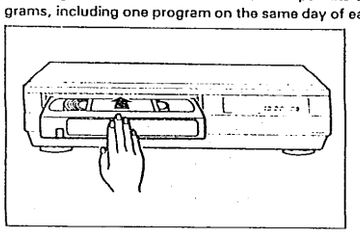
Press "8" ➡ to change

Some TV stations broadcast another sound channel along with selected stereo programs called the SAP (Second Audio Program). The SAP audio is sometimes used to broadcast the second sound track of a bilingual movie.
If desired, you can record the SAP audio on the linear sound tracks by changing the SAP menu display to ON. For normal recording, leave the SAP display set to OFF.

- When OFF appears in the menu display, the SAP function is turned off, and the VCR will not record the SAP.
- When ON appears, the SAP function is turned on and the VCR will record SAP audio when it is broadcast.
- Because SAP is transmitted together with a stereo signal, the STEREO function (described above) must also be set to the STEREO mode before your VCR can record the SAP.
- To hear SAP, the "PLAY SOUND SELECTION" (described above) must be set to "LINEAR".

TIMER RECORDING

The programmable electronic clock/timer permits the unattended recording of up to 8 preselected programs, including one program on the same day of each week or one program at the same time every day.



1. Insert the Cassette.
2. Press the SPEED button to select "SP" or "EP".
3. Set the program timer.
   "START (ON) TIME", "STOP (OFF) TIME", "DAY" etc. See below.
4. Turn power off. Now recording will begin automatically at the start time.

Notes:

- It is not necessary to press RECORD button.
- The TIMER indicator flashes to warn that recording will not occur because cassette has not been inserted. If the safety tab on the cassette has been removed, the VCR will automatically eject the cassette when placed in the Timer mode.

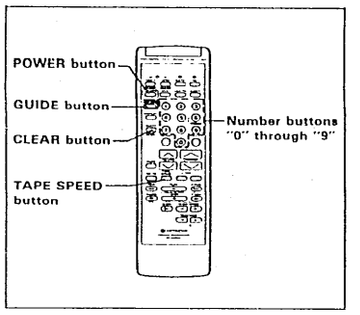
■ Programming the timer for unattended recording

For unattended recording the timer needs to know what **day** to make the recording, the **time to start**, the **time to stop**, and the **channel to be recorded**.

Things to know before starting

- While you are programming the timer, the "menu" display on the TV screen will prompt you through the procedures.
- You can correct an error in the program any time before the last step by pressing CLEAR button repeatedly until the digit to be corrected becomes flashing and then enter the correct digit.
- The programming will automatically resume the "original menu" if no further steps are followed in programming for about 1 minute.

1. Turn on the power of both VCR and TV.
2. Be sure that the TV is set to the video channel (channel 3 or 4).
3. Aim the remote control unit at the receiver on the front panel of the VCR.



4. Press the GUIDE button until the "menu", as illustrated, appears on the TV.

5. Press button "3" to set the program.

— for recording up to 8 programs on a single day or over the days within a period of 1 year.
— for recording up to 8 programs at the same time(s) Monday through Friday within a period of 1 year.
— for recording up to 8 programs on certain days of every week within a period of 1 year.

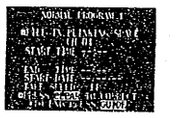
Note: Any one of these program modes or any combination thereof (up to 8 programs in total) may be selected. A typical example of a "Normal" program is demonstrated below.

6. Press button "1". The display will prompt you to select the channel to be recorded.

7. Press two digits for the channel to be recorded (for example, "0" "4" for channel 4).

   Note: If you want to select channel 124 for example, press "100", "2", "4" in this order.

   In this case, "NORMAL/CATV SELECTION" on page 20 should be selected "CATV1" or "CATV2".



8. Press four digits, two for the hour and two more for a minute (for example, "0" "6" "0" "0" for 6:00).

   Note: Always press "0" before a single digit hour and minute.

9. Press "1" for AM or "2" for PM.

TIMER RECORDING (cont)

10. Press four digits, two for the hour and two more for the minute (for example, "0" "7" "3" "0" for 7:30).

11. Press four digits (two for the month and two for the day) (for example, "0" "3" "2" "1" for begin recording on March 21). If you want to select the recording speed, press TAPE SPEED button to select the desired speed.

12. Press the GUIDE button to enter your program and return to the programming "menu" display. Additional programs may be entered by repeating Steps 6 through 11.
    If you have no other programs to enter, press the GUIDE button twice.

13. Turn off VCR power.
    Now recording will begin automatically at the start time.

    Note: To stop a timer recording in progress with the VCR, press POWER button and then press STOP button within 10 seconds.

RECALLING THE PROGRAM

1. Follow Steps 1 through 5 of "Programming the timer for unattended recording".

2. Press "4" button (Program Review).
3. Press "4" again if you want to view the next program information immediately.
4. When you finish reviewing the programs, press the GUIDE button three times to switch off the on-screen display.

CLEARING ("ERASING") INFORMATION FROM A PROGRAM

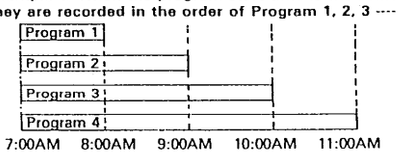
1. Follow Steps 1 through 5 of "Programming the timer for unattended recording".
2. Press "4" button (Program Review).
3. Press "4" again if you want to view the next program information immediately.
4. Press CLEAR button when the program information you want to clear is displayed.
5. Press the GUIDE button three times to switch off the on-screen display.

Note:

- Normal program is cleared automatically when the timer recording is finished, but daily and weekly programs remain in the timer even after the timer recording is finished.

PROGRAM PRIORITY

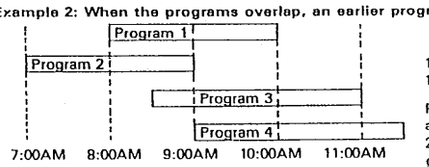
Example 1: When the program start time is the same among the programs on the same day, they are recorded in the order of Program 1, 2, 3 ---- 8.



7:00AM — 8:00AM for Program 1
8:00AM — 9:00AM for Program 2
9:00AM — 10:00AM for Program 3
10:00AM — 11:00AM for Program 4

Program 1 is executed as programmed, and Program 2 as illustrated after Program 1, and Program 3 as illustrated after Programs 1 and 2, and Program 4 as illustrated after Programs 1, 2 and 3.

Example 2: When the programs overlap, an earlier program has priority.



7:00AM — 9:00AM for Program 2
9:00AM — 10:00AM for Program 1
10:00AM — 11:00AM for Program 3
11:00AM — for Program 4

Program 2 is executed as programmed, and Program 1 as illustrated after Program 2, and Program 3 as illustrated after Programs 2 and 1, and Program 4 as illustrated after Programs 2, 1 and 3.

■ To synchro edit the VCR's

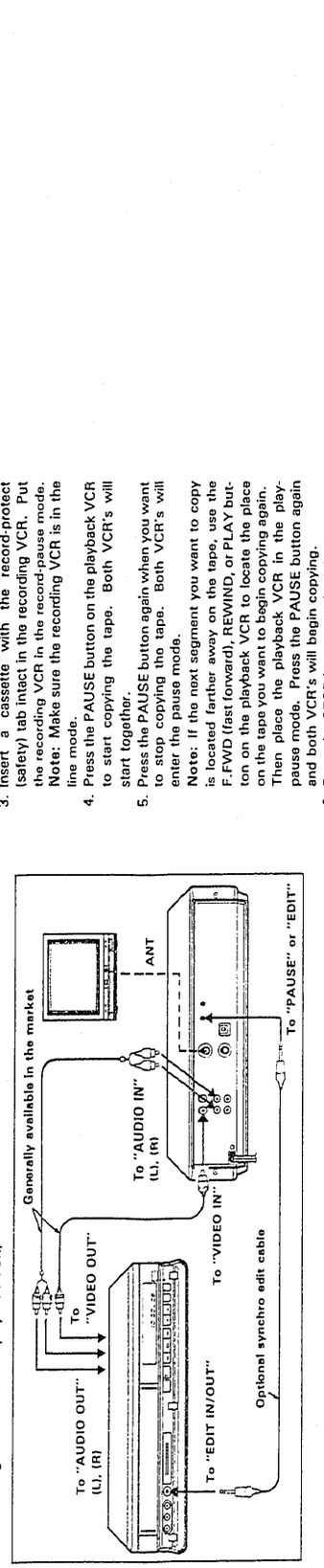
1. Turn on the VCR's and TV.
2. Insert the cassette that you want to copy in the playback VCR. Locate the place on the tape you want to begin coying and put the VCR in the play-pause mode.
3. Insert a cassette with the record-protect (safety) tab intact in the recording VCR. Put the recording VCR in the record-pause mode. Note: Make sure the recording VCR is in the line mode.
4. Press the PAUSE button on the playback VCR to start copying the tape. Both VCR's will start together.
5. Press the PAUSE button again when you want to stop copying the tape. Both VCR's will enter the pause mode.
   Note: If the next segment you want to copy is located farther away on the tape, use the F.FWD (fast forward), REWIND, or PLAY button on the playback VCR to locate the place on the tape you want to begin copying again. Then place the playback VCR in the play-pause mode. Press the PAUSE button again and both VCR's will begin copying.
6. Press the STOP buttons on both VCR's when you are finished.

SYNCHRO EDIT BY USING OPTIONAL SYNCHRO EDIT CABLE

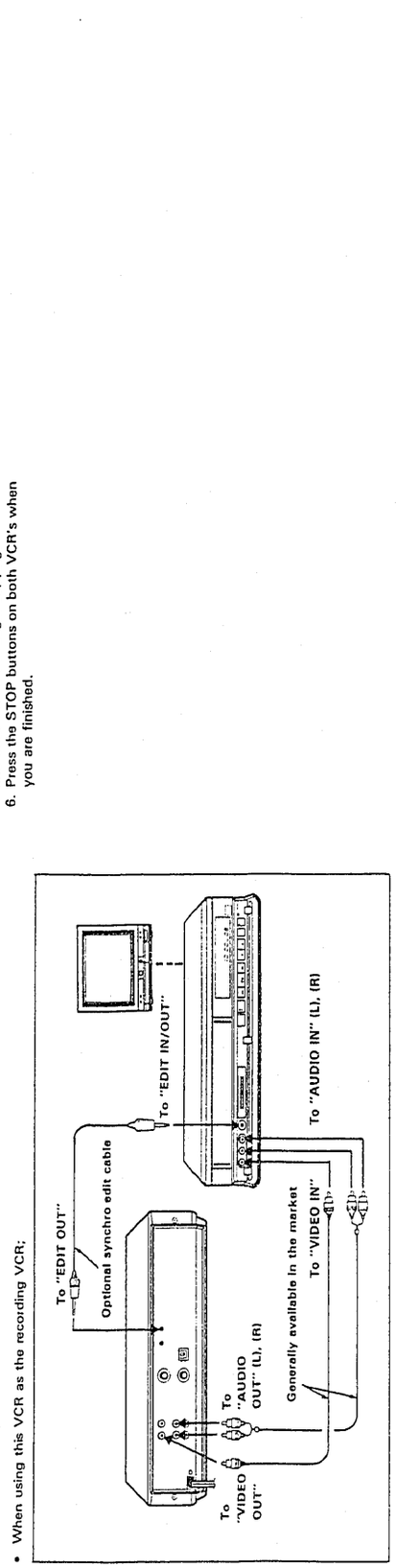
Synchro edit makes tape copying easy by connecting two compatible VCR's with an optional synchro edit cable.
When two VCR's are connected with a synchro edit cable, the playback VCR will automatically stop and start the recording VCR.

■ Connection

• When using this VCR as the playback VCR;



• When using this VCR as the recording VCR;



DISASSEMBLY

1. NAMES AND LOCATIONS OF CIRCUIT BOARDS

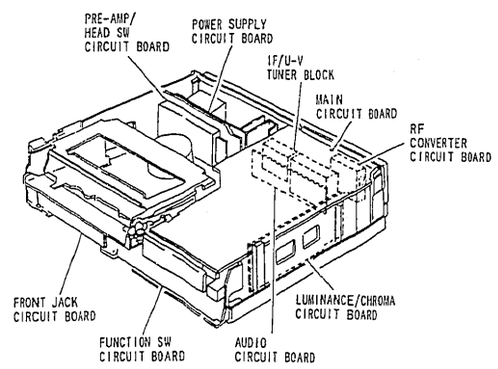


Fig. 1-1 Top View

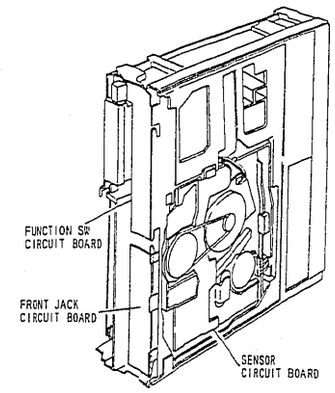


Fig. 1-2 Bottom View

〔Procedure when removing〕
Remove the components in the order of letters (A, B, C ···) in the illustrations.
〔Procedure when reinstalling〕
Reinstall the components by the reverse procedure to removal when not otherwise specified.

2. CASE REMOVAL

1. Top Cover

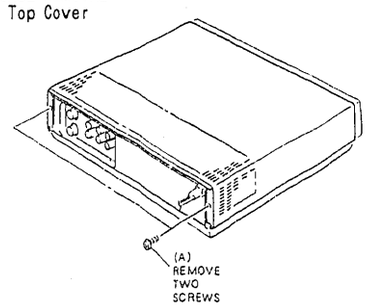


Fig. 2-1

2. Bottom Cover

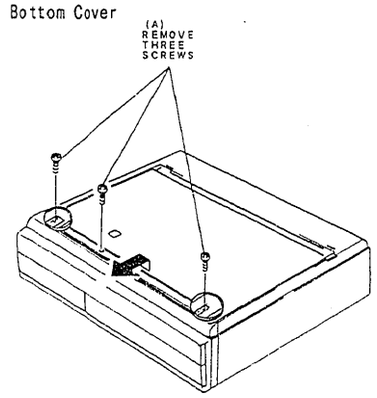


Fig. 2-2

3. Front Panel

* Components to remove first
  1) Top Cover (Item 2-1)
  2) Bottom Cover (Item 2-2)

〔Caution when reinstalling〕
· Reinstall the front panel while the cassette door is pushed in halfway, so that the boss of door actuating arm can be positively engaged with the recess on the side of the door as shown below.

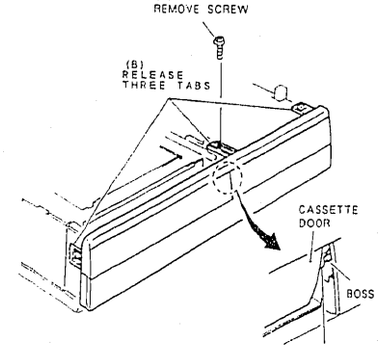


Fig. 2-3

4. Cassette Door

* Components to remove first
  1) Front Panel (Item 2-3)

(Caution when reinstalling)
·Attach the spring at the right of the cassette door firmly.

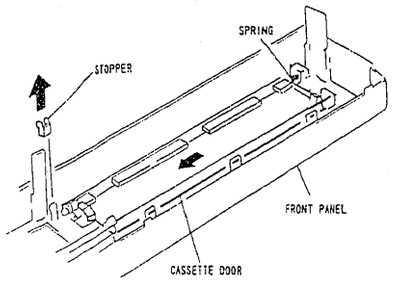


Fig. 2-4

5. Rear Panel

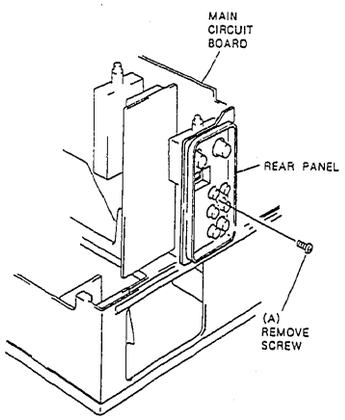


Fig. 2-5

Be sure to remove the cases when servicing and checking the circuit boards.
- Top Cover (see item 2-1)
- Bottom Cover (see item 2-2)
- Front Panel (see item 2-3)

3. CIRCUIT BOARD REMOVAL

1. Function SW, Front Jack Circuit Board

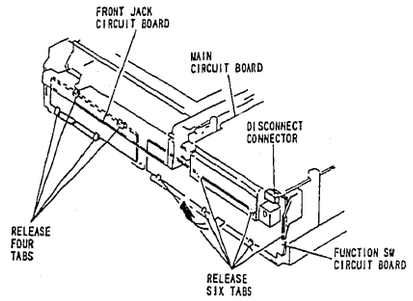


Fig. 3-1

2. Main Circuit Board

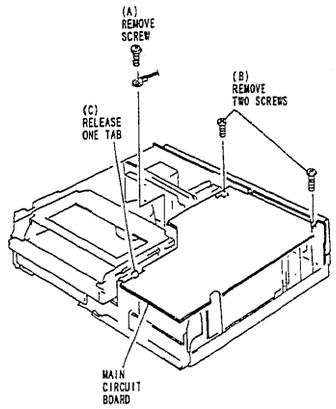


Fig. 3-2

3. Luminance/Chroma and Audio Circuit Board

(Before removing)
1) Remove the main circuit board. (See item 3-2)

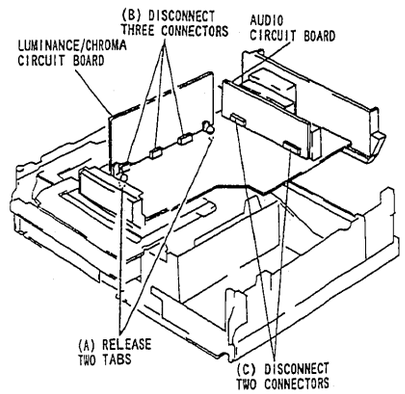


Fig. 3-3

4. Power Supply Circuit Board
5. Pre-Amp/Head SW Circuit Board

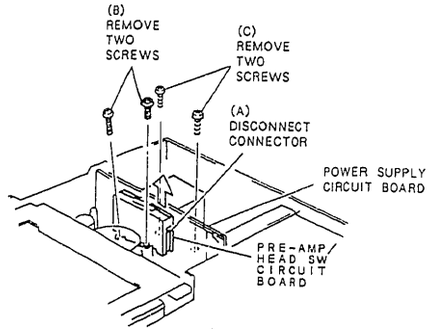


Fig. 3-4

6. Sensor Circuit Board

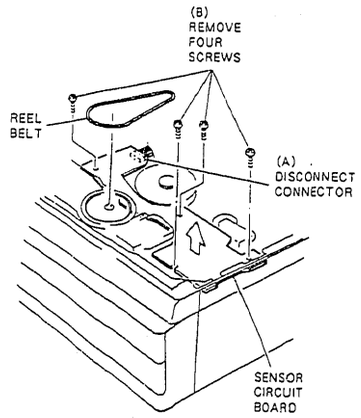
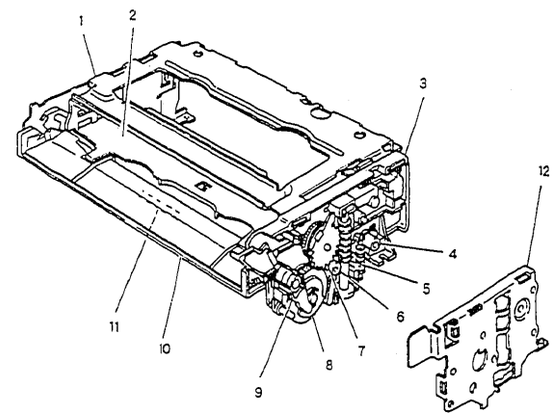


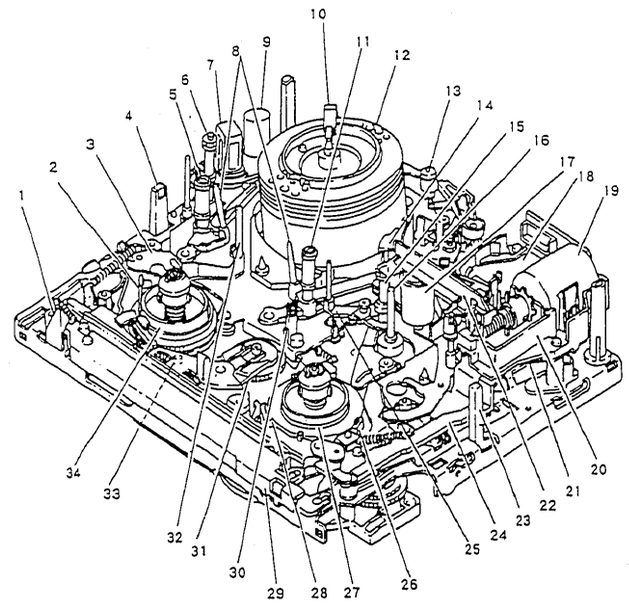
Fig. 3-5

4. IDENTIFICATIONS AND LOCATIONS OF MAIN MECHANICAL COMPONENTS



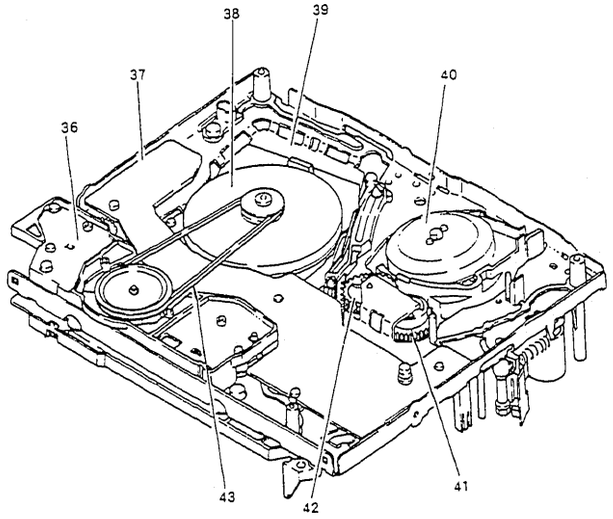
1. Chassis Holder
2. Cassette Holder
3. Gear Bracket
4. Switch Lever (B)
5. FL Worm Gear
6. Switch Lever (A)
7. Worm Wheel
8. Drive Gear
9. Door Arm
10. Front Holder
11. Shaft Pin
12. Side Chassis

Fig. 4-1 Cassette Loading Mechanism



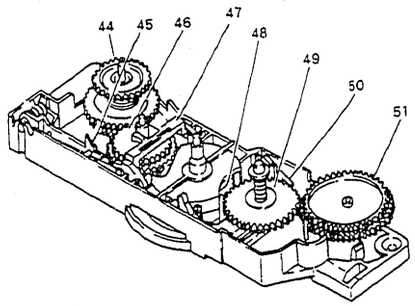
1. Safety Arm
2. Tension Band
3. Tension Arm
4. Supply End Sensor
5. Supply Guide Roller
6. Supply Guide Pole
7. Full Erase (FE) Head
8. Inclined Guides
9. Impedance Roller
10. Ground Brush
11. Take-up Guide Roller
12. Cylinder (Video Heads)
13. Auto Head Cleaning Mechanism
14. Audio/Control (A/C) Head
15. Take-up Guide Pole
16. Capstan Shaft
17. Pressure Roller
18. Mechanism State Switch
19. Loading Motor
20. Loading Motor Holder
21. Load Bracket Assembly
22. Cassette Lid Opener
23. Take-up End Sensor
24. Brake Link Arm
25. Half Loading Arm Assembly
26. Take-up Brake
27. Take-up Reel Disk
28. Take-up Main Brake
29. Slider Block
30. End Lamp
31. Reel Drive Idler
32. Tension Pole
33. Supply Main Brake
34. Supply Reel Disk

Fig. 4-2 Top View of Mechanism



36. Clutch Gear Assembly
37. Sensor P.C.B
38. Capstan Motor
39. Capstan Motor P.C.B
40. Cylinder Motor
41. Supply Loading Gear
42. Take-up Loading Gear
43. Reel Belt

Fig. 4-3 Bottom View of Mechanism



44. Take-up Gear
45. Clutch Arm
46. Change Arm
47. Change Gear
48. Take-up Pulley
49. FL Change Gear
50. FL Change Arm
51. Relay Gear

Fig. 4-4 Clutch Gear Assembly

Refer to the VT-M150A / M151A, AW service manual (No. 3472E) for the removal of the mechanical components.

ELECTRIC CIRCUIT ADJUSTMENT

Test equipment and tapes necessary for adjustment

1) Dual-trace oscilloscope
2) Color bar generator
3) VTVM
4) DC voltmeter
5) Frequency counter
6) Monitor TV (with A/V jacks)
7) Alignment tapes
   - MH-1 : Parts No. 7099046
   - 30HMP2-1 : Parts No. 7099089
   - 24HMASF-2: Parts No. 7099153 (Hi-Fi alignment tape)
8) Blank tape

Cautions on adjustments

1) If there are no special instructions, the following conditions apply.
   - Oscilloscope probe: 10:1
   - Oscilloscope synchronization: Internal sync
   - Ground of test equipment: TP602 (GND) on Main P.C.B
2) When making more than one adjustment, perform the adjustments in the order listed.

Servicing positions

The circuit boards can be set to the servicing positions as follows when servicing and adjusting the VCR.

Fig. 1

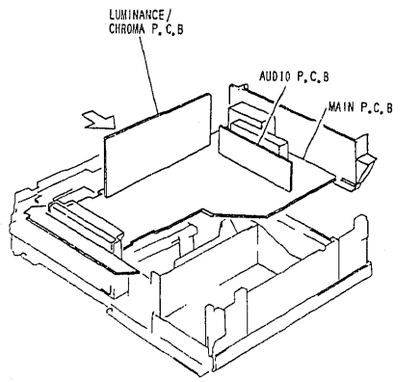


Fig. 2

Usable servicing methods

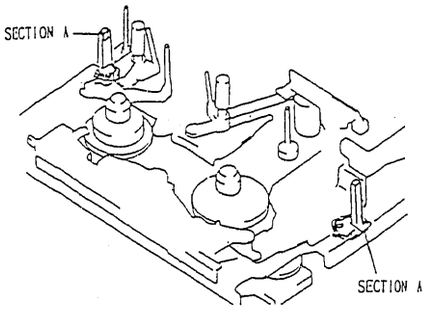
1. To reset the microprocessor
   The microprocessors used in this unit can be reset by pressing switch(S1771) on the Function SW circuit board.

2. To set the VCR to the loading state without loading a cassette
1) Unplug the power cord from the AC outlet.
2) Cover the supply and take-up end sensors (sections A in the figure below) with black masking tape, etc. to shut off the light.
3) Plug the power cord into an AC outlet.
4) Turn the VCR on.
   The VCR can accept the inputs of each mode in this state. However, the rewind operation cannot be performed for more than a few seconds because the take-up reel disk is in the stop state and reel pulses cannot be detected.

[Cautions]

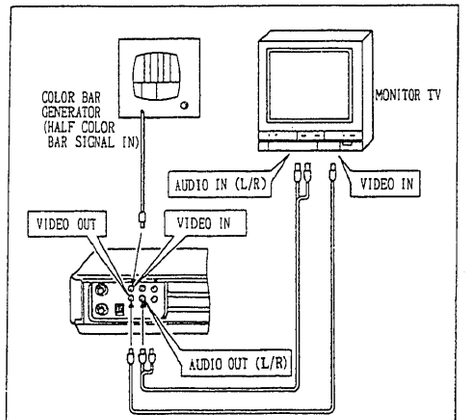
Always return the VCR to the original state in the following order after the above operations have been completed.

1) Remove the masking tape, etc. from the supply and take-up end sensors.
2) Unplug the power cord from the AC outlet once to reset the system control microprocessor.



3. To set the tracking to the center
   If Tracking : Center is specified, press the TRACKING UP(▲) and DOWN(▼) buttons simultaneously to set tracking to the center.

4. Test equipment connection
   Connect test equipment as shown when not otherwise specified.



Setting the conditions of VCR
(1) Set to the external input mode.

Adjustment Parts Locations

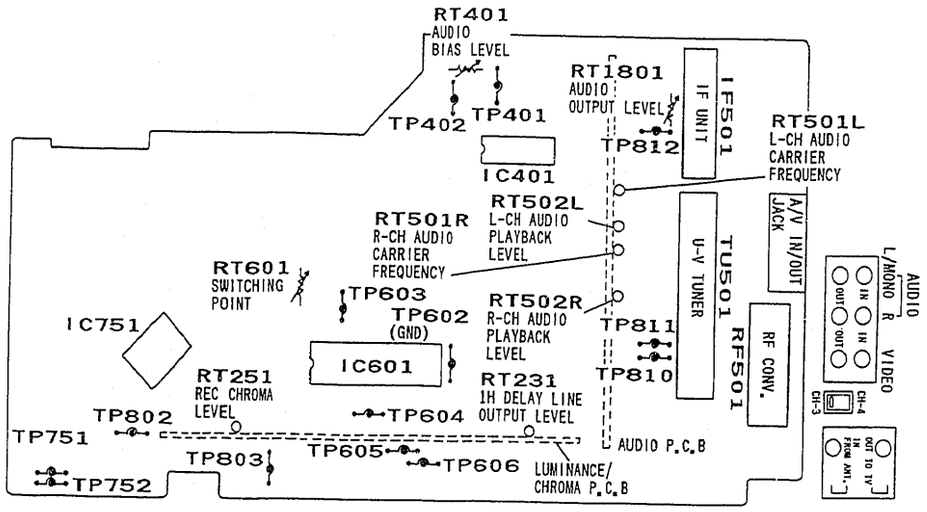


Fig. 1 Main Circuit Board (Solder Side)

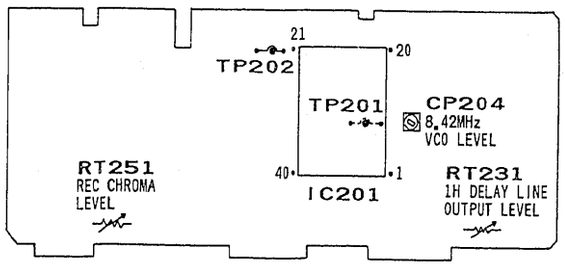


Fig. 2 Luminance/Chroma Circuit Board
(Component Side)

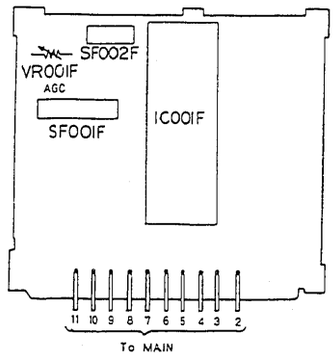


Fig. 3 IF Circuit Board (Component Side)

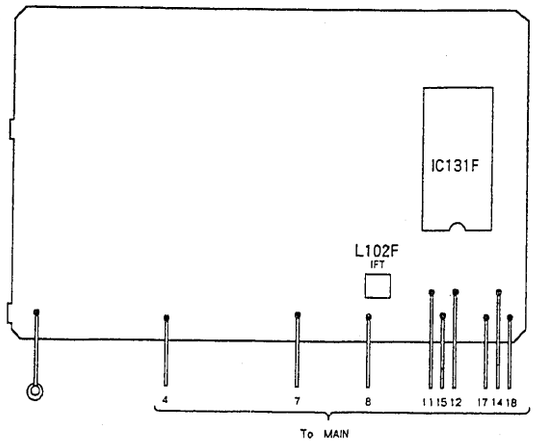


Fig. 4 U-V Tuner Circuit Board
(Component Side)

1. SERVO CIRCUIT ADJUSTMENT

1. Head Switching Point Adjustment

Purpose of adjustment and fault occurring if incomplete

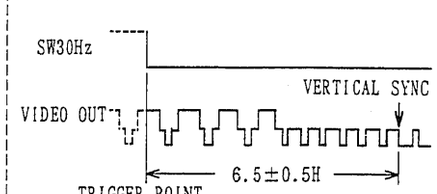
Purpose: To set the video head switching point during play to approximately the center where the CH-1 and CH-2 envelopes overlap each other.

Fault:
- The vertical sync signal is degraded and vertical jitter occurs.
- Switching noise appears across the bottom of the screen.

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Point
· Oscilloscope	· CH-1: VIDEO OUT · CH-2: TP605(SW30Hz)	· Play alignment tape (color bar signal)	· RT601 (SWITCHING POINT)
· Alignment tape (MH-1) (Parts No.7099046)			

Adjustment Procedure
Vertical sync signal:
Set to 6.5H±0.5H from the trailing edge (trigger position) of the SW30Hz pulse.
<Settings of oscilloscope>
· Trigger with CH-2.
· Set the sync slope to "-".

Waveforms



2. Vertical Jitter Correction

Purpose of adjustment and fault occurring if incomplete

Purpose: To Suppress vertical jitter during slow motion and still play.

Fault: Vertical jitter occurs in the picture during slow motion and still play.

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Point
· Color bar generator	· VIDEO IN	· Record color bar signal and play it back with the same VCR.	· TRACKING UP (Remote control) · TRACKING DOWN (Remote control)
· Monitor TV	· Check with monitor TV		
· Blank tape			

Adjustment Procedure
- EP V. jitter correction -
Record in the EP mode and play back in the still mode with the same VCR.
1) Press the PAUSE button of the VCR to set it to the still play mode.
2) Suppress vertical jitter in the picture.

- SP V. jitter correction -
Record in the SP mode and play back in the still mode with the same VCR.
1) Press the PAUSE button of the VCR to set it to the still play mode.
2) Suppress vertical jitter in the picture.

3. Slow Tracking Preset Adjustment

Purpose of adjustment and fault occurring if incomplete

Purpose: To adjust the timing with which brake pulses are generated for the capstan motor during slow play and minimize noise.

Fault:

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Point
· Color bar generator	· VIDEO IN	· Unplug the power cord from AC outlet to set slow tracking to the center.	· TRACKING UP (Remote control) · TRACKING DOWN (Remote control)
· Monitor TV	· Check with monitor TV		
· Blank tape			

Adjustment Procedure
- EP Adjustment -
Record in the EP mode and play back with the same VCR.
1) Play back the recorded section in the slow mode.
2) Observing the monitor screen, move noise to the top of the screen.

- SP Adjustment -
Record in the SP mode and play back with the same VCR.
1) Play back the recorded section in the slow mode.
2) Observing the monitor screen, move noise to the top of the screen.

2. VIDEO CIRCUIT ADJUSTMENTS

1. 8.42MHz VCO Level Adjustment

Purpose of adjustment and fault occurring if incomplete
Purpose: To set the VCO oscillation frequency.
Fault: Colors are displaced or color disappears.

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Point
· Color bar generator · DC Voltmeter	· VIDEO IN · TP201	· Receive a color bar signal (Line input) (E-E mode)	· CP204 (8.42MHz VCO LEVEL)

Adjustment Procedure
1) Adjust CP204 so the DC level is 2.35±0.05V.

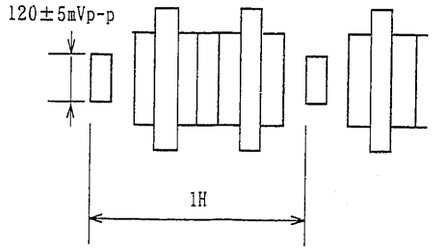
2. Record Chroma Level Adjustment

Purpose of adjustment and fault occurring if incomplete
Purpose: To set the record chroma level to an optimum value.
Fault: Beats may occur or the color may become poor.

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Points
· Color bar generator · Oscilloscope · Blank tape	· VIDEO IN · TP803(Rec Chroma)	· Receive a color bar signal (Line input) · REC mode · EP mode	· RT251 (REC CHROMA LEVEL)

Adjustment Procedure
1) Adjust RT251 so that the color burst level is 120±5mVp-p.

Waveforms



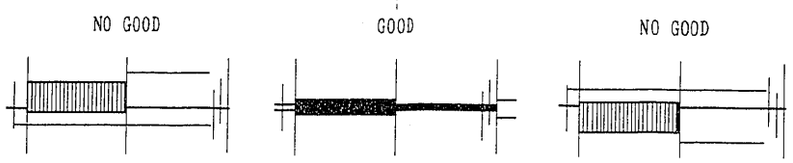
3. 1H Delay Line Output Level Adjustment

Purpose of adjustment and fault occurring if incomplete
Purpose: To set the input and output levels of the CCD 1H DELAY LINE the same.
Fault: Switching noise is conspicuous when dropout is compensated.

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Point
· Oscilloscope · Alignment tape (MH-1) (Parts No.7099046)	· CH-1: TP202 · CH-2: TP605 (SW30Hz)	· Play alignment tape (Color bar signal)	· RT231 (1H DELAY LINE OUTPUT LEVEL)

Adjustment Procedure
1) Adjust RT231 to minimize level at the waveform.

Waveforms



3. AUDIO CIRCUIT ADJUSTMENT

1 .Audio Carrier Frequency Adjustment

Purpose of adjustment and fault occurring if incomplete
Purpose: To set the audio carrier frequency to the specified value.
Fault: Compatibility with tapes recorded by another VCR cannot be obtained.

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Points
· Frequency counter	· TP810 (when adjusting RT501L) · TP811 (when adjusting RT501R)	· No-signal record mode (SP mode)	· RT501L (L-CH) · RT501R (R-CH) (CARRIER FREQUENCY)

Adjustment Procedure
1) RT501L : The frequency counter reads 1302kHz±4kHz.
2) RT501R : The frequency counter reads 1698kHz±4kHz.

2 .Hi-Fi Audio Playback Gain Adjustment

Purpose of adjustment and fault occurring if incomplete
Purpose: To set the Hi-Fi audio playback level to the specified value.
Fault: The optimum volume cannot be obtained.

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Points
· VTVM · Hi-Fi alignment tape (24HMASF-2) (Parts No. 7099153)	· AUDIO OUT L (when adjusting RT502L) · AUDIO OUT R (when adjusting RT502R)	· Play Hi-Fi alignment tape.	· RT502L (L-CH) · RT502R (R-CH) (AUDIO PLAYBACK LEVEL)

Adjustment Procedure
1) RT502L : Set the reading of the VTVM to -4.8dBs±0.1dBs.
2) RT502R : Set the reading of the VTVM to -4.8dBs±0.1dBs.

3. Audio Bias Level Adjustment

Purpose of adjustment and fault occurring if incomplete
Purpose: To set the recording bias to the optimum level.
Fault: · Bias too high : High-frequency response deteriorates.
· Bias too low : Sound tends to be distorted.

Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Points
· VTVM	· TP401 (REC BIAS) · TP402 (BIAS GROUND)	· No-signal record mode (SP mode)	· RT401 (AUDIO BIAS LEVEL)

Adjustment Procedure
1) RT401 : Set the reading of the VTVM to 2.6mV±0.1mVrms.

4. MPX Input Level Adjustment

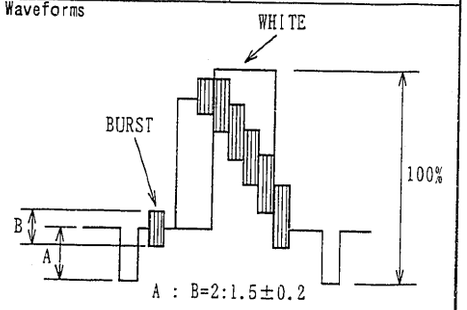
Purpose of adjustment and fault occurring if incomplete Purpose: To set the input level of the MPX signal to the MTS processor in IC1801 from the tuner/IF to the specified level.		Fault: The S/N deteriorates or distortion becomes conspicuous.	
Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Point
· MTS sound signal generator · VTVM	· VHF IN · TP812	· E-E mode	· RT1801 (MPX INPUT LEVEL)
Adjustment Procedure 1) RT1801 : Set the reading of the VTVM to -19.5dBs±0.2dBs (75mV±3mVrms). Note : MTS sound signal generator settings · Audio Freq. : 400Hz · Mod. signal : L+R			

4. IF/TUNER CIRCUIT ADJUSTMENT

1. AGC Adjustment

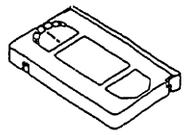
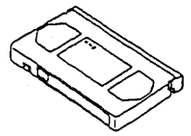
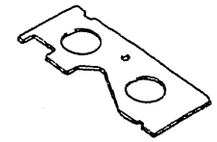
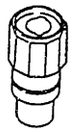
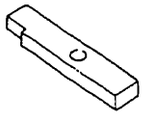
Purpose of adjustment and fault occurring if incomplete Purpose: The AGC adjustment determines the point where the AGC is activated.		Fault:	
Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Points
· RF NTSC color bar generator · DC Voltmeter	· VHF IN · U-V TUNER 6 (AGC)	· Receive a color bar signal.(RF input)	· VR001F (AGC)
Adjustment Procedure 1) Set the VCR/TV select switch to VCR. 2) Supply a 199.25MHz/-44dBm RF NTSC color bar signal with 87.5% modulation to the VHF antenna terminal. 3) Tune in the RF channel supplied by the NTSC color bar generator (select channel 11). 4) Adjust VR001F for 5.1±0.1V DC.			

2. IFT Adjustment

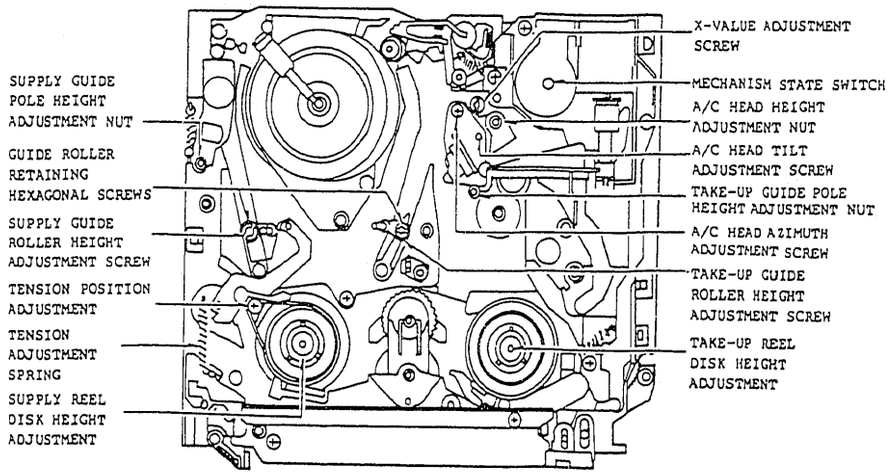
Purpose of adjustment and fault occurring if incomplete Purpose: To set the chroma level to the specified value.		Fault:	
Test Equipment/Jigs	Test Equipment Connection Points	VCR State	Adjustment Point
· RF NTSC color bar generator · Oscilloscope	· VHF IN · IF UNIT-2 (VIDEO)	· Receive a color bar signal.(RF input)	· IFT
Adjustment Procedure 1) Set the VCR/TV select switch to VCR. 2) Supply a 199.25MHz/-44dBm RF NTSC color bar signal with 87.5% modulation to the VHF antenna terminal. 3) Tune in the RF channel supplied by the NTSC color bar generator (select channel 11). 4) Adjust the core of the IFT so the ratio between SYNC level (A) and burst level (B) is 2 : 1.5 . (Note: Check that the yellow level of the chroma signal does not exceed the 100% white level. If it does, readjust the core.)		Waveforms  	

MECHANISM ADJUSTMENT

JIGS AND TAPES FOR ADJUSTMENT

1. Back Tension Meter Parts No.7099004 	2. Alignment Tape - MH-1 - Parts No. 7099046 - 30HMP2-1 - Parts No. 7099089  - 24HMASF-2 - Parts No. 7099153	3. Master Plane Parts No.7099279 
4. Torque Gauge Parts No.7099039 	5. Torque Gauge Adapter Parts No.7099035 	6. Reel Disk Height Jig Parts No.7099038 
7. 1.5mm Hexagonal Wrench 0.9mm Hexagonal Wrench 		

ADJUSTMENT PARTS LOCATIONS


SUPPLY GUIDE POLE HEIGHT ADJUSTMENT NUT
GUIDE ROLLER RETAINING HEXAGONAL SCREWS
SUPPLY GUIDE ROLLER HEIGHT ADJUSTMENT SCREW
TENSION POSITION ADJUSTMENT
TENSION ADJUSTMENT SPRING
SUPPLY REEL DISK HEIGHT ADJUSTMENT
X-VALUE ADJUSTMENT SCREW
MECHANISM STATE SWITCH
A/C HEAD HEIGHT ADJUSTMENT NUT
A/C HEAD TILT ADJUSTMENT SCREW
TAKE-UP GUIDE POLE HEIGHT ADJUSTMENT NUT
A/C HEAD AZIMUTH ADJUSTMENT SCREW
TAKE-UP GUIDE ROLLER HEIGHT ADJUSTMENT SCREW
TAKE-UP REEL DISK HEIGHT ADJUSTMENT

Top View of Mechanism

MECHANICAL PARTS ADJUSTMENT

1. Mechanism State Switch Adjustment

Purpose: To detect the mechanism state correctly and prevent malfunctions.

Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
· Blank tape	———	· Eject mode (with the cassette ejected)	· Mechanism state switch · Mode gear

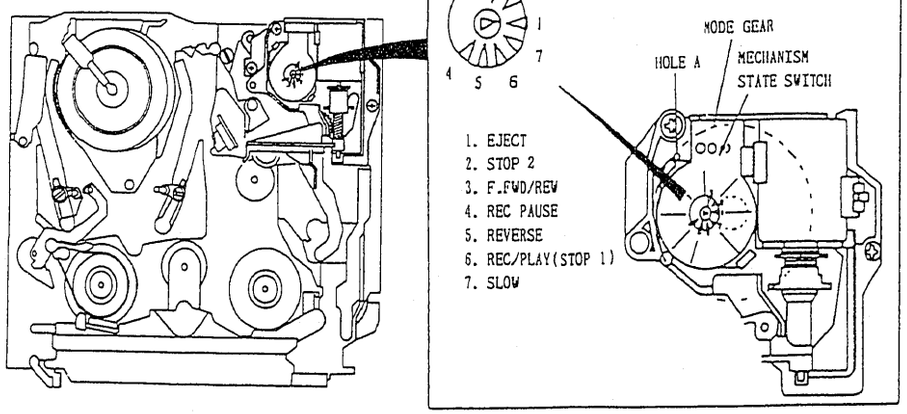
Adjustment procedure

1) Check that the arrow on the center shaft of the mechanism state switch points to the arrow of mechanism mode indication number 1. Also check that hole (A) beside the mechanism state switch and the hole in the mode gear are aligned.

2) If the above alignments are not obtained, adjust as follows.
   1. Remove the mechanism state switch/loading motor assembly.
      (See "MAIN MECHANICAL COMPONENTS REMOVAL" in CHAPTER 2.)
   2. Move the mode gear to align the position of hole (A).
   3. Turn the gear on the back of the mechanism state switch so that the arrow on the center shaft of the switch points to the arrow of mechanism mode indication number 1.
   4. Reinstall the mechanism state switch/loading motor assembly in the above condition.

3) Load a blank tape and perform various operations to check that loading and unloading are performed correctly.

Adjustment diagram



TAPE TRANSPORT SYSTEM PARTS ADJUSTMENT

The tape transport system is the path from the supply reel disk passing through the video heads to the take-up reel disk. The transport system parts, especially the parts which directly come into contact with a tape, should be kept clean without scratches, dust, oil, etc.
The tape transport system has been adjusted before the unit is shipped from the factory. Therefore, when parts in the transport system are replaced, the transport system is stabilized by only adjusting the new parts correctly.

1. Reel Disk Height Adjustment

Purpose: To set the reels of the cassette to the specified height, thus determining the height of tape.

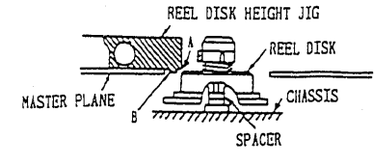
Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
· Master plane (Parts No.7099279) · Reel disk height jig (Parts No.7099038)	1) Remove the cassette loading mechanism. 2) Mount the master plane and place the reel disk height jig on it.	———	· Spacers in the supply and take-up reel disks

Adjustment procedure

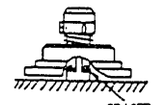
1) Check that the reel disk is between sections A and B of the reel disk height jig.
2) If the disk is not between sections A and B of the jig, replace the spacer (0.5mm thick) in the reel disk or adjust them.

(Caution)
When the tension arm and tension band are removed, adjust the tension pole position and tension after reinstalling them.

Adjustment diagram



SUPPLY REEL DISK



TAKE-UP REEL DISK

2. Tension Pole Position and Tension Adjustment

Purpose: To make the tension of tape constant so that the contact between the video heads and tape is stabilized.

Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
Position adjustment ———	———	1) Remove the top cover. 2) Set the VCR to the loading state without inserting a cassette. (See page 4-12)	Position adjustment: Tension band holder
Tension adjustment ・Back Tension Meter (Parts No.7099004)	———	Tension adjustment 3) Play the tension cassette.	Tension adjustment: Tension spring hooking position

Adjustment procedure

- Position Adjustment -

1) Loosen the tension band retaining screw.
2) Insert the tension band holder into one of grooves 1 to 3 and set the gap between the tension pole and chassis to -0.5 to 2mm.
3) Tighten the tension band retaining screw.
4) After adjustment is completed, perform loading without inserting a cassette and recheck the tension pole position.

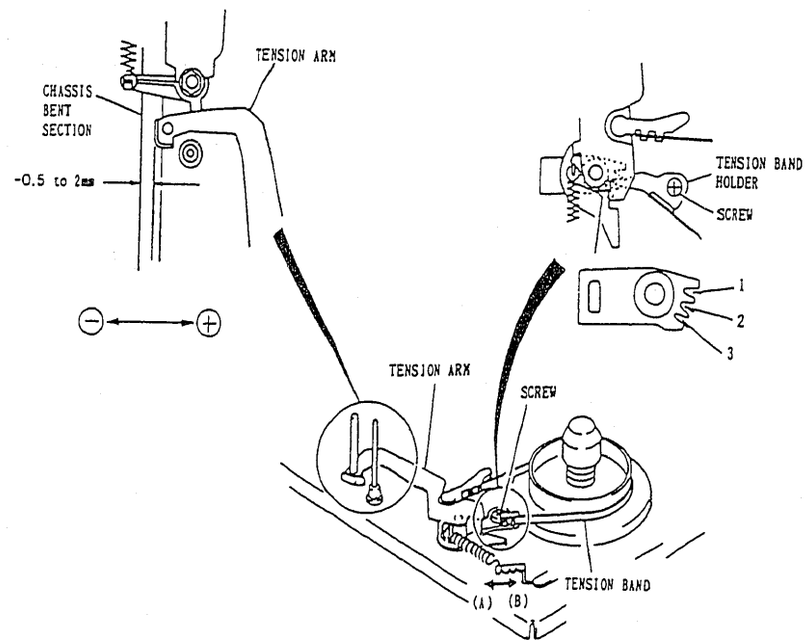
- Tension Adjustment -

Reading of Back Tension Meter: 34 to 44 g-cm
(reference value)

If the reading is higher than the reference, move the spring in direction (A).
If the reading is lower than the reference, move the spring in direction (B).

Caution: When the tension position is changed greatly (more than 6 g-cm), recheck the tension pole position. If it is drifted, readjust the tension pole position and tension.

Adjustment diagram



3. Guide Pole Height Adjustment

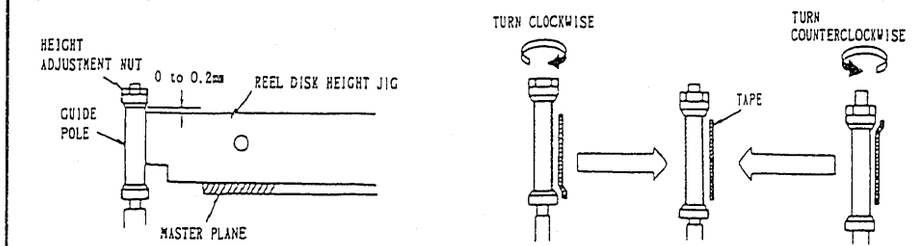
Purpose: To regulate the tape height.

Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
・Master plane (Parts No.7099279) ・Reel disk height jig (Parts No.7099038)	1) Remove the cassette loading mechanism. 2) Mount the master plane and place the reel disk height jig on it.	———	・Nuts on the supply and take-up guide poles
・Blank tape	———	・Playback mode	

Adjustment procedure

1) Set the clearance between the bottom of the guide pole's upper flange and top of the reel disk height jig is 0 to 0.2mm.
2) Load a blank tape to run it and check that the tape does not ride over the upper and lower flanges of the guide pole.
3) If the tape rides over either flange, adjust the height of guide pole as follows.
If the tape rides over the upper flange, turn the nut counterclockwise.
If the tape rides over the lower flange, turn the nut clockwise.

Adjustment diagram



4. Guide Roller Height Adjustment

Purpose: To regulate the height of tape so that the bottom of tape runs along the tape guide line on the cylinder.

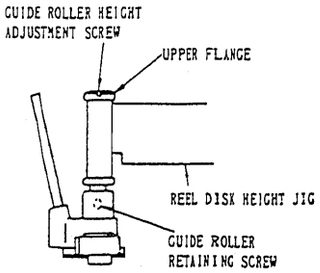
Coarse Adjustment

Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
・Master plane (Parts No.7099279) ・Reel disk height jig (Parts No.7099038) ・0.9mm Hexagonal wrench	1) Remove the cassette loading mechanism. 2) Mount the master plane and place the reel disk height jig on it.	———	Height adjustment screws on the supply and take-up guide rollers

Adjustment procedure

1) Loosen the guide roller retaining screw (so that the guide roller does not turn during loading, unloading and play).
2) Align the bottom of the guide roller's upper flange and the top of the reel disk height jig.
3) Perform the precise adjustment continuously.

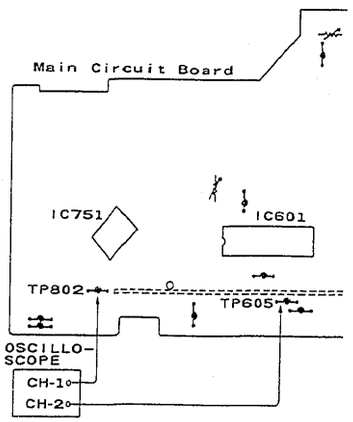
Adjustment diagram



Precise Adjustment

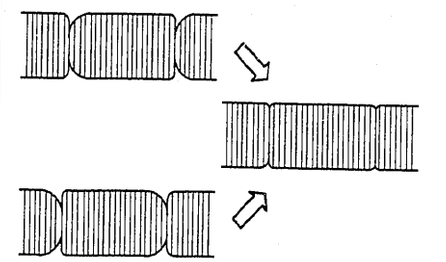
Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
· Oscilloscope	· CH-1: TP802 (PB FM) · CH-2: TP605 (SW30Hz)	· Play alignment tape (Color bars section)	· Guide roller height adjustment screws
· Alignment tape (30HMP2-1) (Parts No.7099089)			
· 0.9mm Hexagonal wrench			

Connection diagram

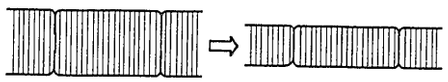


Adjustment procedure
1) Tracking control (playback) : Center position (when this adjustment is performed after the cylinder has been replaced, set the tracking control so that the FM output is maximum.)
2) Connect TP751 and TP603 on the main board. Short circuit between TP751 and TP752 on the main board for 2 seconds, and remove the short circuit.By this, the digitron is entered the test mode, and "◁◁ ▷▷" is displayed.
3) Height adjustment screw : Flatten the FM envelope.
4) Press the tracking control up and down buttons.
5) Check that the FM drops at the start and end of FM envelope are uniform.
6) Tighten the guide roller retaining screw.
7) Remove the jumper and reshort circuit between TP751 and TP752 for 2 seconds, and remove the short circuit.

Waveforms



Turn the guide roller height adjustment screw slightly to flatten the waveform.



Tracking control at center

Press the tracking control buttons.

5. Audio / Control (A/C) Head Adjustment

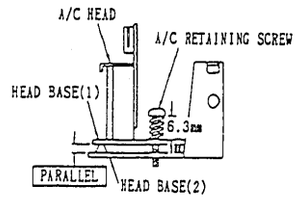
Purpose: To keep the contact between the tape and head even so the specified track is recorded and played back.

Coarse Adjustment

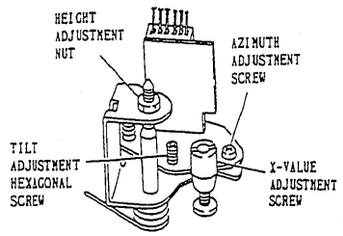
Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
· Master plane (Parts No.7099279) · Reel disk height jig (Parts No.7099038) · 1.5mm Hexagonal wrench	1) Remove the cassette loading mechanism. 2) Mount the master plane and place the reel disk height jig on it.	——	· A/C head retaining screw · Azimuth adjustment screw · Height adjustment nut · Tilt adjustment screw
· Blank tape	——	· Run the blank tape.	

Adjustment procedure/adjustment diagrams

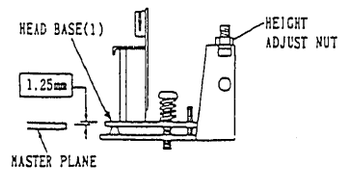
1) A/C head retaining screw: Check that the spring section of the A/C head retaining screw protrudes 6.3mm over the top of head base (1).



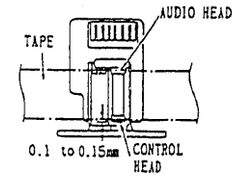
2) Tilt adjustment hexagonal screw, azimuth adjustment screw: Make head bases (1) and (2) parallel.



3) Height adjustment nut: Set the clearance between the master plane and head base (1) to approx. 1.25mm.



4) Remove the adjustment jigs, load a blank tape and set the VCR to the play mode.
5) Check that there is no conspicuous curling and riding over around the A/C head. If there is conspicuous curling or riding over, readjust the tilt adjustment hexagonal screw, azimuth adjustment screw and height adjustment nut. When the bottom edge of tape is 0.1 to 0.15mm from the bottom edge of the control head's core, the height of A/C head is ideal.



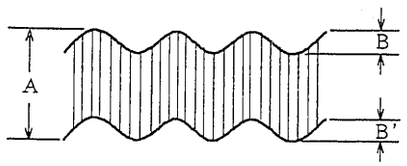
6) Perform the precise adjustment continuously.

Precise Adjustment

Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
· Oscilloscope	· AUDIO OUT jack	· Play alignment tape (7KHz section if MH-1 alignment tape is used)	· Azimuth adjustment screw · Height adjustment nut · Tilt adjustment screw
· Alignment tapes (Parts No. 7099046) (Parts No. 7099089)	——		
· 1.5mm Hexagonal wrench			

Adjustment procedure
1) Adjust the azimuth adjustment screw, height adjustment nut and tilt adjustment hexagonal screw slightly and alternately: Make the audio output maximum and flat (minimum fluctuations).

Waveform diagram



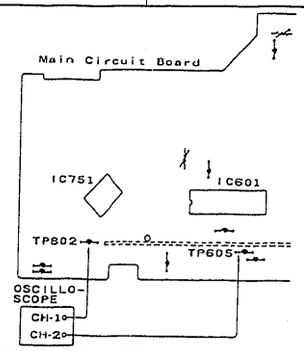
A: Maximum B B': Minimum

6. X Value Adjustment

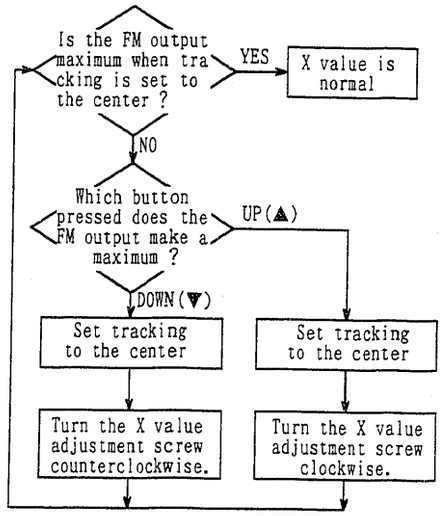
Purpose: To obtain compatibility with other VCRs.

Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
· Oscilloscope	· CH-1: TP802 (PB FM) · CH-2: TP605 (SW30Hz)	· Play alignment tape (Step waveform if MH-1 alignment tape is used)	· X value adjustment screw
· Alignment tapes (Parts No. 7099046) (Parts No. 7099089)	—		
· 1.5mm Hexagonal wrench			

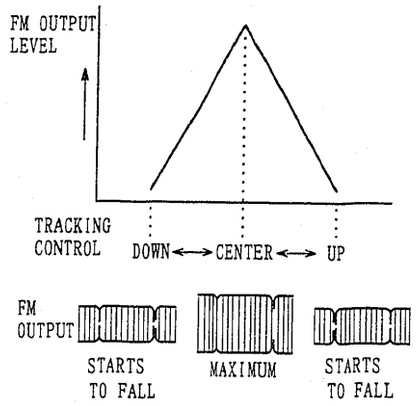
Connection diagram



Adjustment procedure
(Adjustment using 30HMP2-1 alignment tape)
Connect TP751 and TP603 on the main circuit board. Short circuit between TP751 and TP752 on the main board for 2 seconds, and remove the short circuit. By this, the digitron is entered the test mode, and "◁◁ ▷▷" is displayed.


Is the FM output maximum when tracking is set to the center ?
YES
X value is normal
NO
Which button pressed does the FM output make a maximum ?
UP(▲)
DOWN(▼)
Set tracking to the center
Set tracking to the center
Turn the X value adjustment screw counterclockwise.
Turn the X value adjustment screw clockwise.

To set the tracking to the center
Press the TRACKING UP and TRACKING DOWN buttons simultaneously to set tracking to the center.



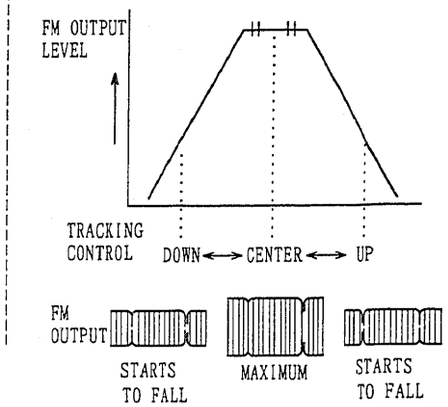
After the X-value adjustment is completed, remove the jumper and reshort circuit between TP751 and TP752 for 2 seconds, and remove the short circuit.

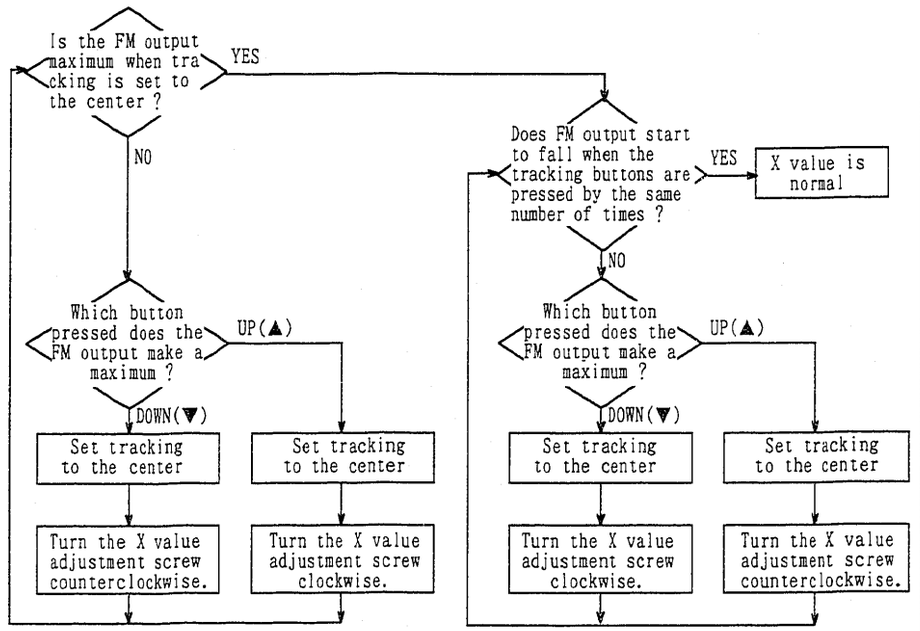
Adjustment procedure
(Adjustment using MH-1 alignment tape)
Connect TP751 and TP603 on the main circuit board. Shrt circuit between TP751 and TP752 on the main board for 2 seconds, and remove the short circuit. By this, the digitron is entered the test mode, and "◁◁ ▷▷" is displayed.

After the X-value adjustment is completed, remove the jumper and reshort circuit between TP751 and TP752 for 2 seconds, and remove the short circuit.

To set the tracking to the center
Press the TRACKING UP and TRACKING DOWN buttons simultaneously to set tracking to the center.

Adjustment diagram




Is the FM output maximum when tracking is set to the center ?
YES
NO
Which button pressed does the FM output make a maximum ?
UP(▲)
DOWN(▼)
Set tracking to the center
Set tracking to the center
Turn the X value adjustment screw counterclockwise.
Turn the X value adjustment screw clockwise.
Does FM output start to fall when the tracking buttons are pressed by the same number of times ?
YES
X value is normal
NO
Which button pressed does the FM output make a maximum ?
UP(▲)
DOWN(▼)
Set tracking to the center
Set tracking to the center
Turn the X value adjustment screw clockwise.
Turn the X value adjustment screw counterclockwise.

7. Adjustments After Replacing Cylinder (Video Heads)

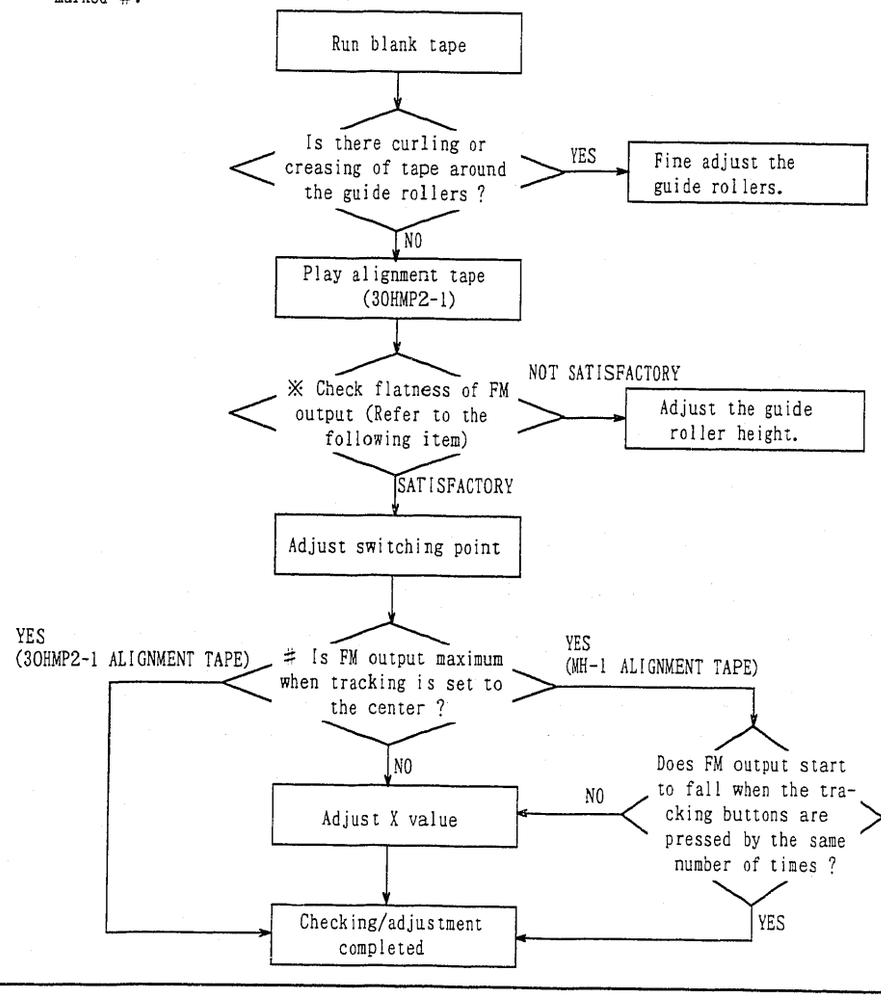
Purpose: To suppress drift in the height relative to the guide roller and to minimize the X value after replacing the cylinder.

Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
· Oscilloscope	Checking the flatness · CH-1: TP802 (PB FM) · CH-2: TP605 (SW30Hz)	· Run the blank tape · Play alignment tape (Stairsteps section)	· Guide rollers (precise adjustment on page 4-6) · Head switching point (page 3-3) · X value (page 4-8)
· Alignment tapes (Parts No. 7099046) (Parts No. 7099089)			
· Blank tape			
· 0.9mm/1.5mm Hexagonal wrenches			
· X value adjustment screwdriver			

Checking/adjustment procedure

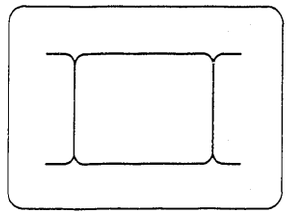
NOTE-1 : Connect test equipment referring to connection diagram on page 4-6 when checking the item marked ※.

NOTE-2 : Connect test equipment referring to connection diagram on page 4-8 when checking the item marked #.

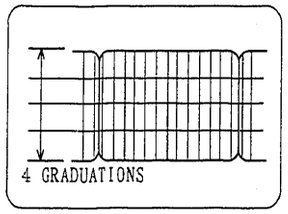

Run blank tape
Is there curling or creasing of tape around the guide rollers ?
YES
Fine adjust the guide rollers.
NO
Play alignment tape (30HMP2-1)
※ Check flatness of FM output (Refer to the following item)
NOT SATISFACTORY
Adjust the guide roller height.
SATISFACTORY
Adjust switching point
YES (30HMP2-1 ALIGNMENT TAPE)
Is FM output maximum when tracking is set to the center ?
YES (MH-1 ALIGNMENT TAPE)
NO
Adjust X value
NO
Does FM output start to fall when the tracking buttons are pressed by the same number of times ?
YES
Checking/adjustment completed

Checking procedure of the flatness and fluctuations of FM output and waveform diagrams

1) Use the tracking control buttons to maximize the FM output.

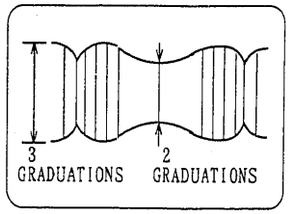


2) Fine tune the voltage level range of the oscilloscope to set the FM output to 4 graduations.



3) Press the tracking control buttons to set the maximum amplitude of the FM output to 3 graduations.

4) Check that the minimum amplitude is more than 2 graduations.



5) Check that the level fluctuations between the maximum and minimum amplitudes are less than 13%.

8. Tension/Torque Checks

Purpose: It is necessary to check the tension, torque and compression force at the tape take-up section and moving section to make the tape running smooth and satisfy the basic performance of the VCR. Check these if the tape running is not smooth or the tape speed is abnormal.

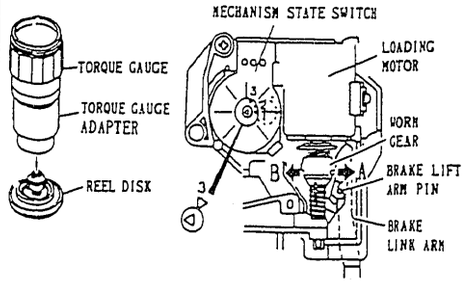
Test equipment/jigs		State of VCR	
· Torque gauge · Torque gauge adapter		· Set the VCR to each operation mode without inserting a cassette. (See page 4-11)	
Item	VTR operation mode	Measured reel	Measured value
Main brake torque	Stop (Note)	Supply & take-up reels	170 g·cm or more
Slack removal torque	Unloading	Supply reel	90 ~ 230 g·cm
Fast forward torque	Fast forward	Take-up reel	400 g·cm or more
Rewind torque	Rewind	Supply reel	400 g·cm or more
Take-up torque	Play	Take-up reel	80 ~ 170 g·cm
Back-tension torque	Fast forward	Supply reel	4 ~ 25 g·cm
	Rewind	Take-up reel	

Checking method

The values are measured using a torque gauge and torque gauge adapter with the torque gauge fixed.

Note: Turn the worm gear in the direction of arrow (A) in the stop mode and shift the pointer on the mechanism state switch to "3" so as to apply the main brake to the supply reel disk. Then turn the worm gear in the direction of arrow (B) so that brake link arm is released from the brake lift arm pin. (Set the reel drive idler to the center position.)

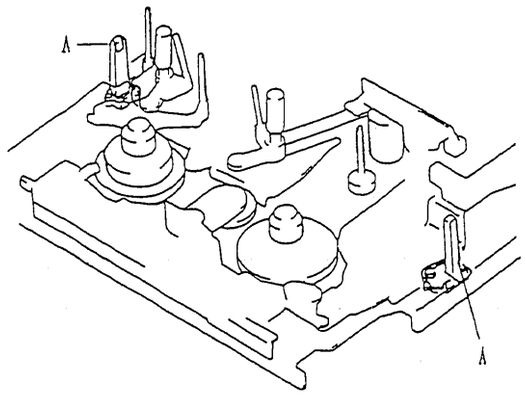
Adjustment diagram



9. To Set the VOR to the Loading State without Inserting a Cassette

1) Remove the top cover and front panel. 2) Remove the cassette loading mechanism. 3) Unplug the power cord form the AC outlet. 4) Cover the supply and take-up end sensors (sections A in the figure below) with black masking tape, etc. to shut off the light. 5) Plug the power cord into the AC outlet. 6) Turn the VCR on. The VCR can accept the inputs of each mode in this state. However, the rewind operation cannot be performed for more than a few seconds because the take-up reel disk in the stop state and reel pulses cannot be detected.	(Cautions) Always return the VCR to the original state in the following order after the above operations have been performed. 1) Remove the masking tape, etc. from the supply and take-up end sensors. 2) Unplug the power cord from the AC outlet to reset the system control microprocessor.

Adjustment diagram



MAINTENANCE/INSPECTION PROCEDURE

1. Required Maintenance

The recording density of a VCR is much higher than that of an audio tape recorder. VCR components must be very precise, at tolerances of 1/1000 mm, to ensure compatible with other VCRs. If any of these components are worn or dirty, the symptoms will be the same as if the part is defective. To ensure a good picture, periodic inspection and maintenance, including replacement of worn-out parts and lubrications, is necessary.

2. Scheduled Maintenance

Schedules for maintenance and inspection are not fixed because they are greatly according to the way in which the customer uses the VCR, and the environment in which the VCR is used. But, in general home use, a good picture will be maintained if the inspection and maintenance is done every 1,000 hours. The table below shows the relation between time used and inspection period.

Table 1

Average hours used per day	When inspection is necessary: About 1 year	About 18 months	About 3 years
One hour	↓	↓	↓
Two hours	↓		
Three hours	↓		

3. Check before starting Repairs

The following faults can be remedied by cleaning and oiling. Check the need for lubrication and the conditions of cleanliness in the unit. Check with the customer to find out how often the unit is used. If from that you determine that the unit is ready for inspection and maintenance, check the following parts.

Table 2

Phenomenon	Inspection Location
Poor S/N, no color	Dirt on video head or worn video head
Tape does not run or tape is slack	Dirt on pressure roller, reel belt or flywheel belt
Vertical jitter horizontal jitter	Dirt on video head or in tape transport system
Color beats	Dirt on full-erase head
Low volume or sound distorted	Dirt on audio/control head
Fast forward or rewind is not done or rotation is slow	Dirt on reel belt

4. Tools Needed for Inspection and Maintenance

(1) Head cleaning kit
(2) VCR oil kit
(3) Alcohol
(4) Gauze
(5) Screwdriver for adjusting X-value

Table 3 Locations for Greasing and Oiling using the Kit

Name	Oil or Greasing Location
Sonic Slidas Oil (#1600)	Oil low-speed rotating sections
Froil (GB-TS-1)	Lubricate metal or molded sections under light load
Lock paint	Fix adjustment screws

The above oils and greases are in the kit prepared especially for VCR maintenance. Use this kit for lubrication.

5. Maintenance Procedures

5-1 Cleaning

(1) Cleaning video head

First use a cleaning tape. If dirt on head is too stubborn to remove by tape, use the cleaning kit. Moisten the cleaning stick with cleaning fluid at the point indicated. Touch the stick to the head tip and gently turn the head (rotating cylinder) to the right and left. (Do not move the stick vertically and make sure that only the chamois leather on the stick comes into contact with the head. Otherwise, the head may be damaged.)
Thoroughly dry the head. Then test run a tape. If cleaning fluid remains on the video head, the tape may be damaged when in comes into contact with the head surface.

(2) Cleaning the tape transport system and drive system, ect.

Wipe with gauze moistened with alcohol.

Notes:
1) The tape transport system is the system which comes into contact with the running tape. The drive system consists of those parts which run the tape.
2) Make sure that during cleaning you do not touch the tape transport system with the tip of a screwdriver and that no force is applied to the system that could deform it.

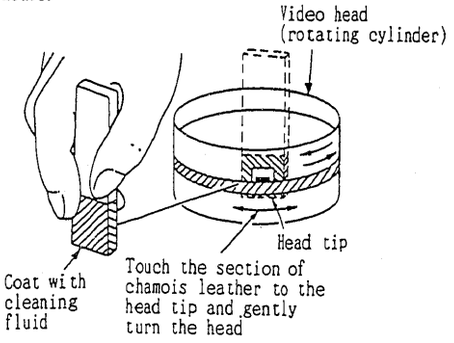
5-2 Lubrication

(1) Guidelines for lubricating with oil

Use the oiler to apply one or two drop of Sonic Slidas oil. Make sure not to use too much oil because it may spill over or leak out coming into contact with rotating parts and causing slippage or other problems. If too much oil is applied, wipe clean with alcohol.

(2) Periodic oil lubrication

Oil specified locations every 1,000 hours.


Video head
(rotating cylinder)
Head tip
Coat with cleaning fluid
Touch the section of chamois leather to the head tip and gently turn the head

5-3 Greasing

(1) Greasing guidelines

Apply grease Froil, with a stick or brush. Do not use excess grease. It may come into contact with the tape transport or drive system. Wipe any excess and clean with gauze moistened with alcohol.

(2) Periodic greasing

Grease specified locations every 5,000 hours.

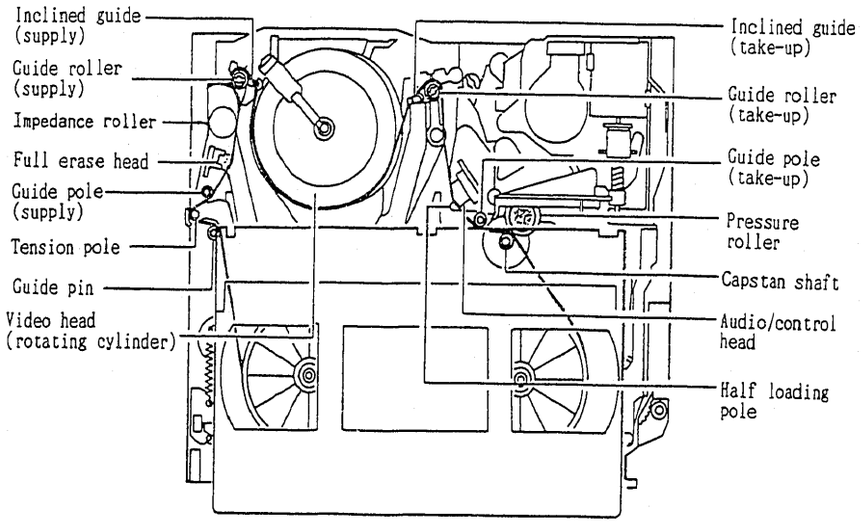


Fig. 1 Tape Transport System

6. Inspection Locations

Phenomenon	Inspection Location	Replacement	
Color beats	Dirt on full erase head		①
Poor S/N, no color	Dirt on video heads	○	②
Vertical jitter	Dirt on video heads Dirt in tape transport system		③
Low volume, sound disordered	Dirt on audio/control head	○	④
Tape does not run. Tape is slack.	Dirt on pressure roller	○	⑤

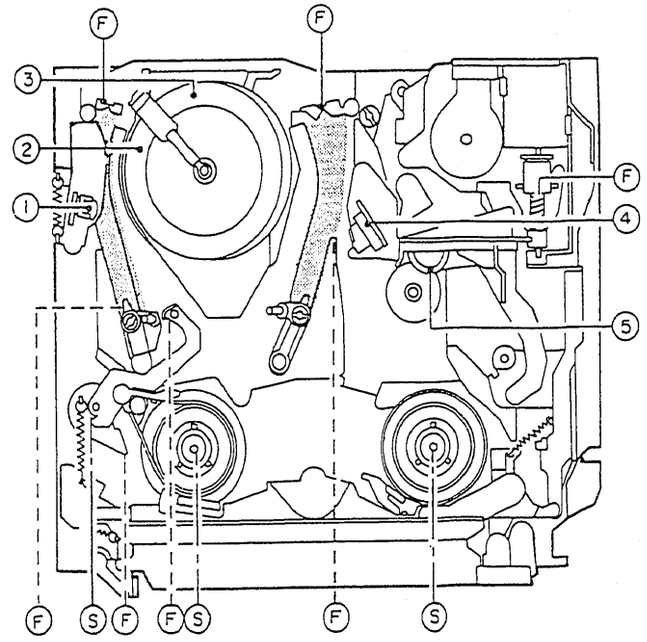
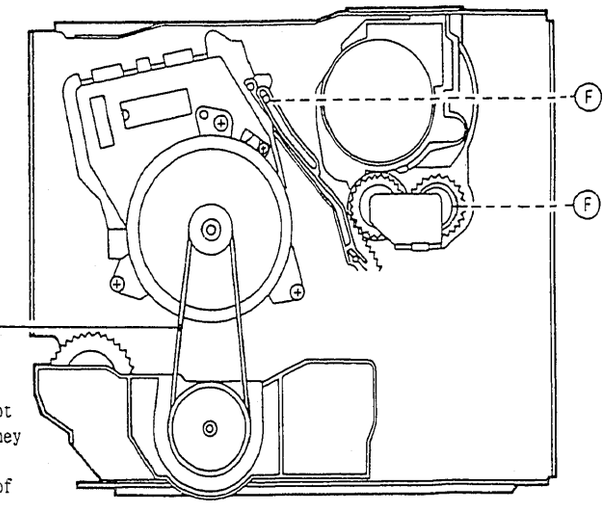


Fig. 2 Top View of Mechanism

Phenomenon	Inspection Location	Replacement
Does not fast forward or rewind, or rotation is slow	Dirt on reel belt	○
Tape dose not run		
Slack tape		



Note:
If locations marked with "⊖" do not operate normally after cleaning, they are worn. Replace.
See the EXPLODED VIEWS at the end of this manual as well as the above illustrations for the sections to be lubricated and greased.

Fig. 3 Bottom View of Mechanism

(S) : Sonic Slidas oil (oil locations)

(F) : Froil (grease locations)

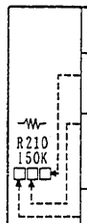
CHAPTER 5

SCHEMATIC/CIRCUIT BOARD DIAGRAMS

BEFORE USING THIS SERVICE REFERENCE MATERIAL

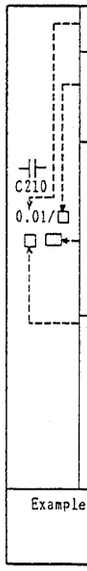
How to read abbreviations

(Resistors)



	Value	Not indicated ·· Ω (ohm) K ····· KΩ
	Toler-ance	Not indicated ·· ±5% K ····· ±10% M ····· ±20%
	Wattage	Not indicated ·· 1/8W (All values other than 1/8W are indicated in the schematic diagrams with W omitted)
	Sort	Not indicated ·· Carbon film RC ····· Carbon solid RW ····· Wire wound RS ····· Metal oxide film RN ····· Metal film
Example: R210 ····· 150kohm, carbon solid RC1/2K 1/2W, ±10%		

(Capacitors)



	Value	Not indicated ·· μF P ····· PF
	Dielect-ric strength	Not indicated ·· 50WV (All values other than 50WV and electrolytic capacitors are indicated in the schematic diagrams with WV omitted)
	Toler-ance	Not indicated ·· ±10% J ····· ±5% M ····· ±20% C ····· ±0.25PF Z ····· +80% -20% (No tolerance is indicated for electrolytic capacitors (excluding tantalum and high stability electrolytic capacitors))
	Sort	Not indicated ·· Ceramic General electrolytic (distinguished from ceramic with circuit symbol) MYL ····· Mylar (polyester film) STY ····· Styrol TA ····· Tantalum KU ····· High stability electrolytic MP ····· Metalized paper
Example: C210 0.01/25 ··· Mylar, 0.01μF, 25WV, ±5% MYL J		

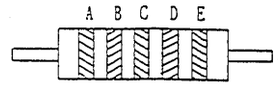
Notes:
1. Voltages are measured with the negative ⊖ terminal of the power supply as reference in the normal operating mode.
   The voltages in different modes are indicated in the schematic diagrams ; those in parentheses ( ) are in the record mode and those without parentheses are in the play mode.
2. The value, dielectric strength (wattage), tolerance and sort of resistors (excluding variable resistors, etc.) and capacitors are indicated in the schematic diagrams by abbreviations. Replace them correctly, comparing the abbreviations in the schematic diagrams and the table 'how to read abbreviations'.

Cautions on use of MOS IC

1. The MOS IC is inserted in black foam for shipment. This foam is a conductor which short-circuits between the lends to prevent damage. Do not remove ICs from this foam during their storage. Avoid removing ICs from this foam, placing them on plastic which is likely to be charged with static electricity or inserting them into styrol foam.
2. High voltages may be applied during soldering caused by leakages from the soldering iron, so be sure to ground the tip of the soldering iron or use a low voltage soldering iron.
3. The human body, clothes made of synthetic fibers or nylon gloves may be charged with several thousands volts of static electricity because of friction, so a worker should be grounded.
4. Be sure to grounded measuring instruments such as oscilloscopes ,VTVMs, etc. used for repairs.

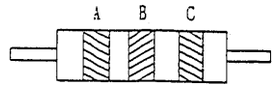
How to read capacity and inductance of resistor shape capacitors and coils

CAPACITOR



CAPACITY: (10A+B) × C (PF)
TOLERANCE : D
RATED VOLTAGE : BODY COLOR
PINK : 25V
GREEN : 50V
CHARACTERISTIC : E

COIL



INDUCTANCE: (10A+B) × C (μH)

COLOR	A,B	C	D	E
Black	0	10^0	±20%	For temperature compensation
Brown	1	10^1		
Red	2	10^2		
Orange	3	10^3		
Yellow	4	10^4		
Green	5	10^5		
Blue	6			
Violet	7			
Gray	8		±30%	High dielectric constant type
White	9			For temperature compensation
Gold		10^{-1}	±5%	
Silver		10^{-2}	±10%	High dielectric type

SERVICE MANUAL ABBREVIATION LIST

A	
A.DUB	Audio Dub
ACC	Automatic Color Control
ACK	Automatic Color Killer
ADD	Adder
AFC	Automatic Frequency Control
AGC	Automatic Gain Control
ALC	Automatic Level Control
ASBL	Assemble (Phase Matching)
APC	Automatic Phase Control
AUX	Auxiliary
B	
BATT.	Battery
BG	Burst Gate or Back Ground
BGP	Burst Gate Pulse
BH	Power Supply for Selecting VHF High Band
BL	Power Supply for Selecting VHF Low Band
BPF	Band-pass Filter
BS	Power Supply for Selecting VHF Super Band
BU	Power Supply for Selecting UHF Band
BUF.	Buffer Amplifier
C	
C	Chroma
C.FG/CFG	Capstan Frequency Generater
C.MEMORY	Counter Memory
C.PAUSE	Camera Pause
C.RESET	Counter Reset
C.REVERSE	Count Reverse
C.SYNC	Composite Synchronizing Signal
C/R	Capacitor/Resistor
CATV	Cable TV
CAPST.	Capstan
CCD	Charge Coupled Device
CH	Channel
CNR	Chroma Noise Reducer
CHAR.	Character
COM.	Common
COMP-EXP	Compressor-Expander
COMPA	Comparator
COMPE	Compensator
COM.	Composite
CONV.	Converter
CORR.	Correlation
COUNT.	Counter
CST	Cassette
CTL	Control Track Pulse
CYL.	Cylinder
D	
D/A	Digital to Analog
D/W	Dark/White
DA	Double Azimuth
DEEMPH.	Deemphasis
DEMOD.	Demodulator
DET	Detector
DISCRI.	Discriminator
DISP.	Display
DL	Delay line
DN	Down
DO	Dropout
DOC	Dropout Compensator
E	
E-E	Electronic-to-Electronic
EA-ROM	Electrically Alterable Read Only Memory
EMPH	Emphasis
EQ	Equalizer
EXT.	External
F	
FF	Flip Flop
F.FWD	Fast Forward
FG	Frequency Generator
FM	Frequency Modulation
FRAME ADV./F.ADV	Frame Advance
fsc	Color Sub Carrier Frequency
FWD	Forward
G	
GEN	Generator
GND	Ground
H	
HD	Horizontal Drive
Hi-Fi	High Fidelity
HPF	High-pass Filter
HPL	High-pass Limiter
HSS	Horizontal Sync. Separator
I	
I/O	In/Out (Input/Output)
IF	Intermediate Frequency
INDI.	Indicator
INT.	Internal
INV.	Inverter
IR	Infrared Rays
IRT	Instant Recording Timer
L	
LCD	Liquid Crystal Display
LIN.	Linear
LNC	Line Noise Canceller
LM	Loading Motor
LOG.	Logarithm
LPF	Low-pass Filter
L/R	Left/Right
LP	Long play
M	
M.CUT	Monitor Cut
M.STATE	Mechanism State
M.STOP	Memory Stop
MEM.	Memory
MIX	Mixer
MM	Monostable Multivibrator
MOD.	Modulator
MPX	Multiplex
MTS	Multi Channel Television Sound
N	
NF	Negative Feed Back
NORM.or NOR.	Normal
NR	Noise Reduction

O	
OSC	Oscillator
OSD	On-Screen Display
P	
PB/PLAY	Playback
PIF	Picture Intermediate Frequency
PLL	Phase Locked Loop
POS.	Positive
POWER CONT.	Power Control
PROG.	Program
PROTECT.	Protector
PWM	Pulse Width Modulation
R	
REC	Record
RECT.	Rectifier
REF	Reference
REG	Regulator
REV	Reverse
REW	Rewind
RF	Radio Frequency
RAM	Randum Access Memorey
ROM	Read Only Memory
S	
S/H	Sample and Hold
S.REEL	Supply Reel Sensor
S.TRACK.	Slow Tracking
S-VHS	Super VHS
SAW	Sawtooth
SAP	Second Audio Program
SEP.	Separator
SIF	Sound Intermediate Frequency
SP	Standard Play
SRCH	Search
SRV	Servo
SW 25Hz	Head Switching Pulse
SYNC	Synchronizing Signal
SYS.CON	System Control
T	
T/L	Tuner/Line
T.BRAKE	Take-up Brake
TμP	Timer Microprocessor
T.REEL	Take-up Reel Sensor
T.RESET	Timer Reset
TP	Test Point
TRS	Transfer
TU-μP	Tuning Microprocessor
U	
U/D	Up/Down
UNI.	Unified
V	
V-REF	Voltage Reference
V.DRV	Vertical Drive Pulse
V.DUB	Video Dub
VAR.	Variable
VCA	Voltage Controlled Amplitier
VCO	Voltage Controlled Oscillator
VHS	Video Home Systems
Vss	Voltage Super Source
VOL.	Volume
VSS	Vertical Sync. Separator
VT	Tuning Voltage
VT-U	Tuning Voltage-UHF
VT-V	Tuning Voltage-VHF
W	
WE	Weighting
Y	
Y/C	Luminance/Chrominance

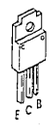
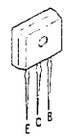
DIGITAL PROCESS CIRCUIT

A	
ADC B-Y	Analog to Digital Converted B-Y Signal
ADC R-Y	Analog to Digital Converted R-Y Signal
ADC Y	Analog to Digital Converted Luminance
ADRS	Address
C	
CAS	Column Address Strobe
C.BLANK	Chroma Blanking
D	
DRAM	Dynamic Random Access Memory
DEMPX	Demultiplexer
DWC	Delayed Write Clock
DT/OE	Data Transfer /Output Enable
D.REF 25	Delayed Reference 25Hz
D.SW 25	Delayed Switching 25Hz
I	
INC	Row Counter Increment
M	
MEM	Memory
MEM VIDEO	Memorized Video
MEM SW	Memory Switch
MEM ON	Memory ON
MPX	Multiplexer
MPX VIDEO	Multiplexed Video
O	
O/E	Odd/Even Field
P	
P IN P	Picture in Picture
PIX MOVE	Picture Move
R	
RC	Reading Clock
RCC	Reading Clock Clear
RCR	Row Counter Reset
RAS	Row Address Strobe
REF 25	Reference 25Hz from servo circuit
REL	Refresh Control
S	
SC	Serial Control
W	
WC	Write Clock
WCC	Write Clock Clear
WRITE ENBL (WE)	Write Enable

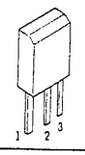
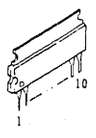
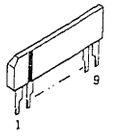
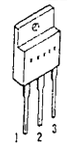
SEMICONDUCTOR CONFIGURATION

When replacing a semiconductor, take care of its pin numbers and makings (recess, paint) so as not to insert it in reverse.

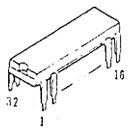
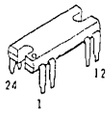
TRANSISTOR

1	2	3	4
			
2SA854SQR 2SA673C 2SA844CD	2SC1740S 2SA933 DTC144ES 2SC3553(B/C) 2SA1390C XDC144ES 2SD1504E	2SD1765	2SD1504E

IC(SINGLE INLINE PACKAGE)

1	2	3	4	5
				
S-8053ALB	DN6851HI	XRA6209U4	NJM2248S LAV521S-2	M5F7805L

IC(DUAL INLINE PACKAGE)

1	2	3
		
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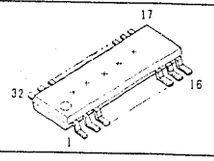	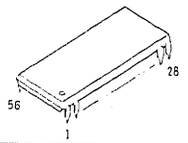	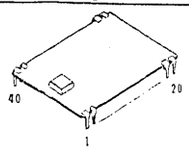
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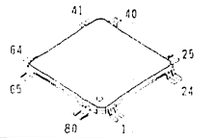
7		
		
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INTERNAL WIRING DIAGRAM (For F350A)

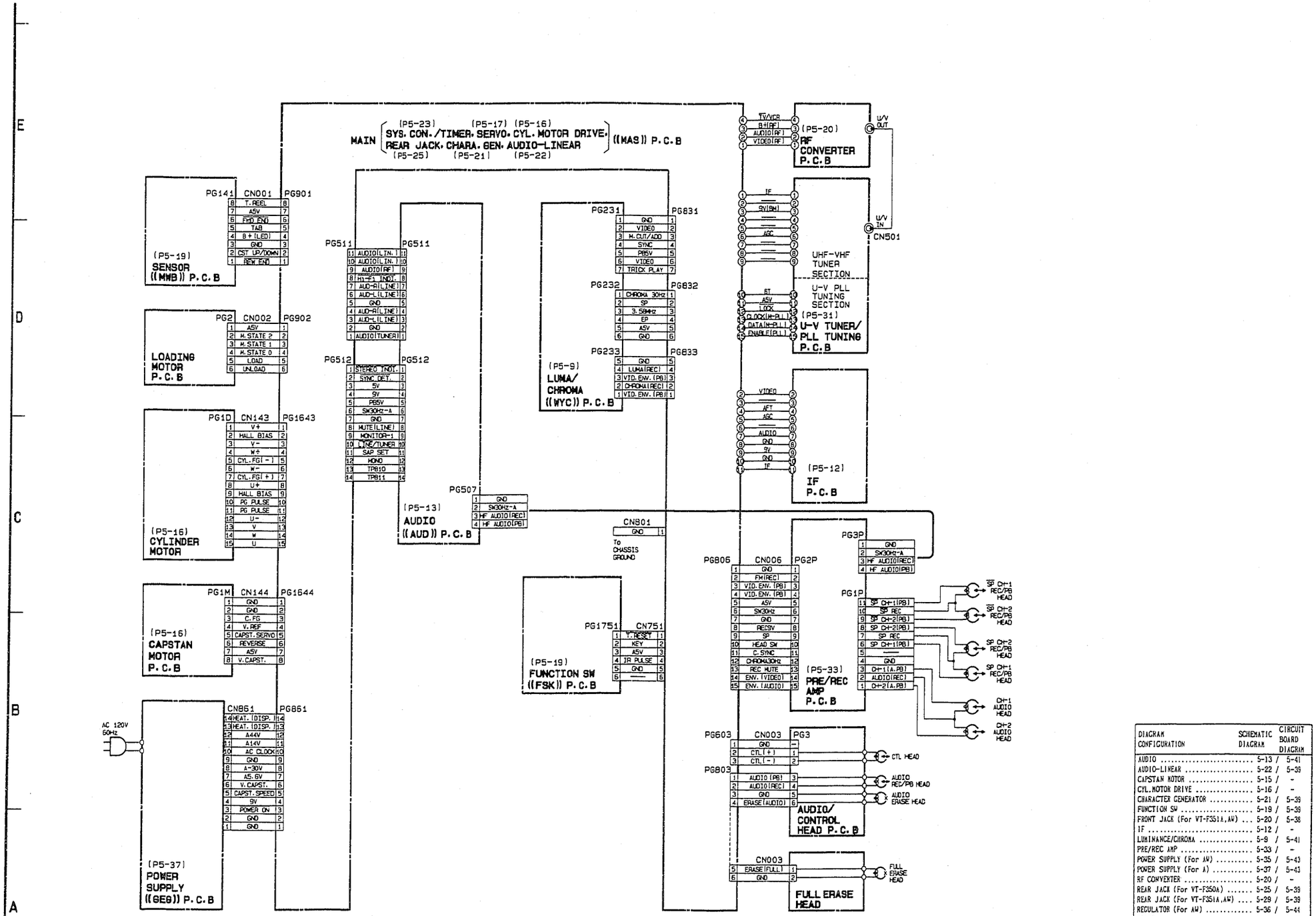


DIAGRAM CONFIGURATION	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
AUDIO	5-13 /	5-41
AUDIO-LINEAR	5-22 /	5-39
CAPSTAN MOTOR	5-15 /	-
CYL.MOTOR DRIVE	5-16 /	-
CHARACTER GENERATOR	5-21 /	5-39
FUNCTION SW	5-19 /	5-38
FRONT JACK (For VT-F351A,AW)	5-20 /	5-36
IF	5-12 /	-
LUMINANCE/CHROMA	5-9 /	5-41
PRE/REC AMP	5-33 /	-
POWER SUPPLY (For AW)	5-35 /	5-43
POWER SUPPLY (For A)	5-37 /	5-43
RF CONVERTER	5-20 /	-
REAR JACK (For VT-F350A)	5-25 /	5-39
REAR JACK (For VT-F351A,AW)	5-29 /	5-39
REGULATOR (For AW)	5-36 /	5-44
SERVO	5-17 /	5-39
SENSOR	5-19 /	5-38
SYS.CON./TIMER (For VT-F350A)	5-23 /	5-39
SYS.CON./TIMER (For VT-F351A,AW)	5-27 /	5-39
U-V TUNER	5-31 /	-

INTERNAL WIRING DIAGRAM (For F351A, AW)

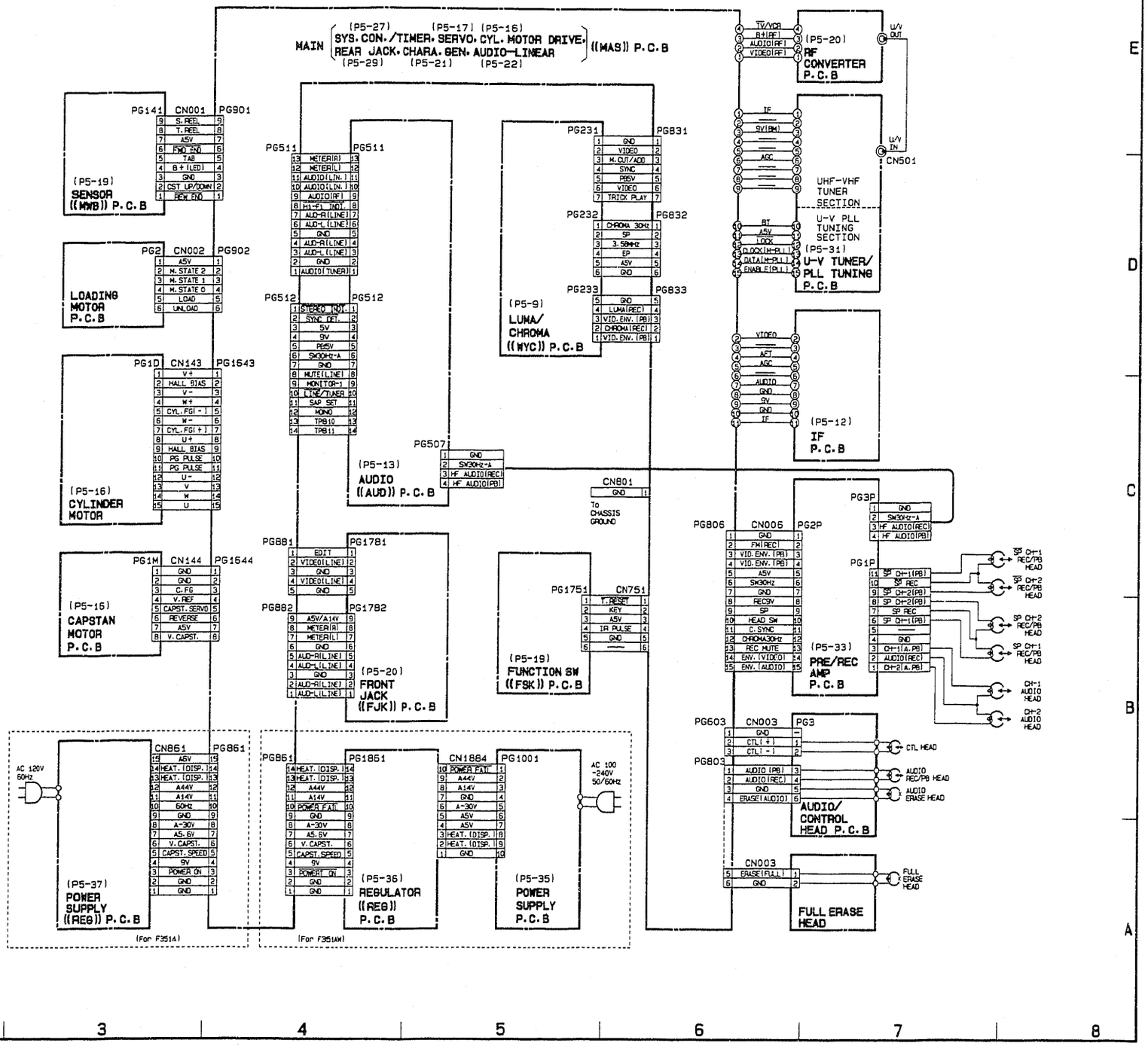
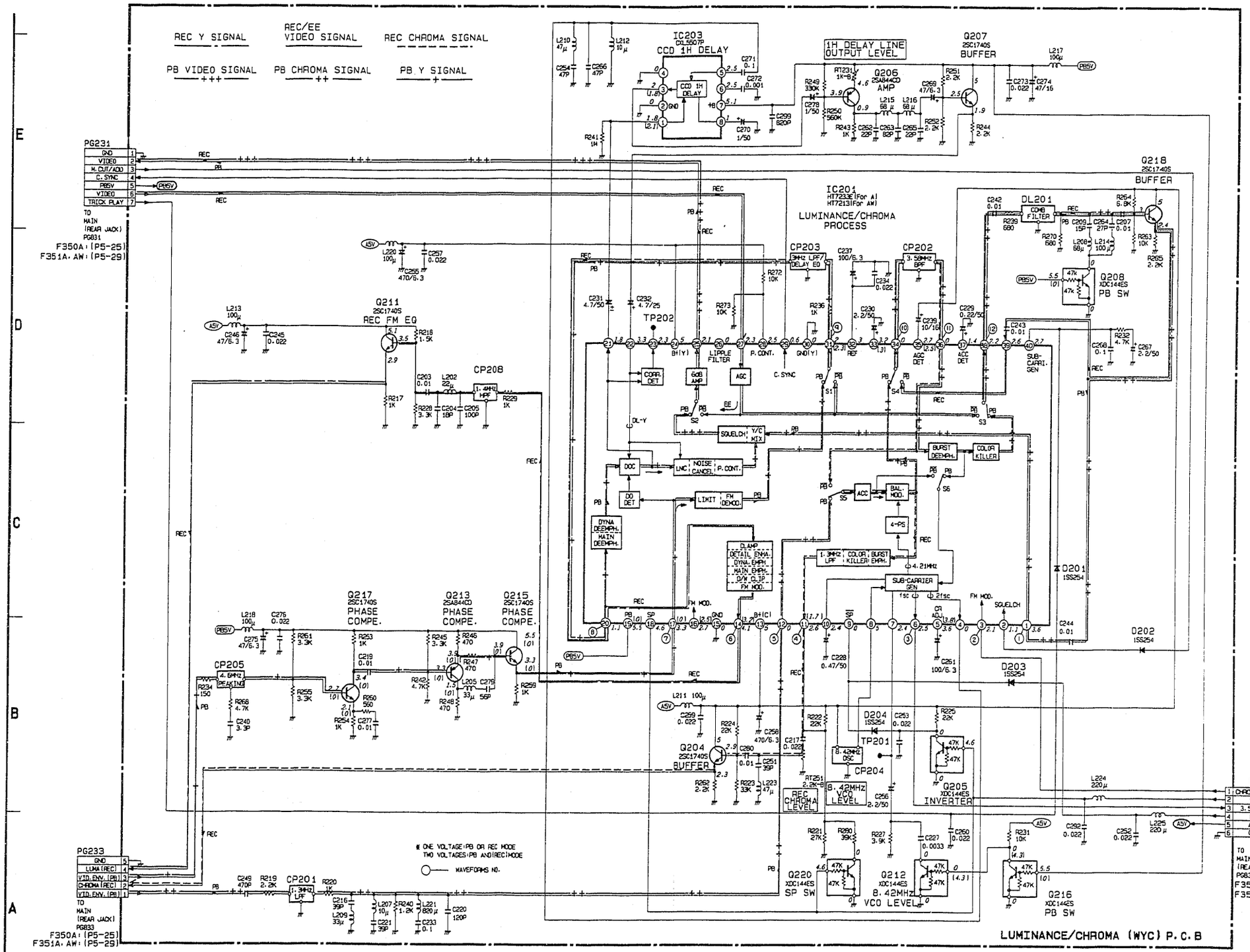


DIAGRAM CONFIGURATION	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
AUDIO	5-13 /	5-41
AUDIO-LINEAR	5-22 /	5-39
CAPSTAN MOTOR	5-15 /	-
CYL.MOTOR DRIVE	5-16 /	-
CHARACTER GENERATOR	5-21 /	5-39
FUNCTION SW	5-19 /	5-39
FRONT JACK (For VT-F351A,AW)	5-20 /	5-38
IF	5-12 /	-
LUMINANCE/CHROMA	5-9 /	5-41
PRE/REC AMP	5-33 /	-
POWER SUPPLY (For AW)	5-35 /	5-43
POWER SUPPLY (For A)	5-37 /	5-43
RF CONVERTER	5-20 /	-
REAR JACK (For VT-F350A)	5-25 /	5-39
REAR JACK (For VT-F351A,AW)	5-29 /	5-39
REGULATOR (For AW)	5-36 /	5-44
SERVO	5-17 /	5-39
SENSOR	5-19 /	5-38
SYS.CON./TIMER (For VT-F350A)	5-23 /	5-39
SYS.CON./TIMER (For VT-F351A,AW)	5-27 /	5-39
U-V TUNER	5-31 /	-

LUMINANCE/CHROMA SCHEMATIC DIAGRAM



LUMINANCE/CHROMA WAVEFORMS

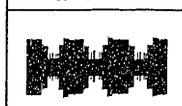
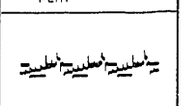
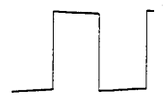
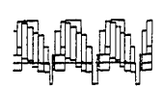
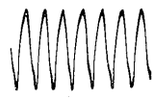
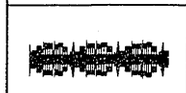
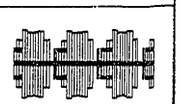
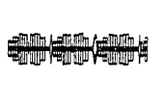
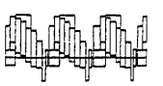
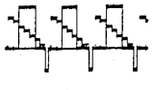
1-A IC201-1 190mVp-p 50mV/20.0μ sec. cm REC/PLAY	8-B IC201-20 210mVp-p 0.1V/20.0μ sec. cm PLAY
	
2-A IC201-3 4.4Vp-p 1V/5.0msec. cm REC/PLAY	9-A IC201-31 800mVp-P 0.2V/20.0μ sec. cm REC
	
3-A IC201-6 490mVp-p 0.1V/200nsec. cm REC/PLAY	9-B IC201-31 510mVp-P 0.2V/20.0μ sec. cm PLAY
	
4-A IC201-11 190mVp-p 50mV/20.0μ sec. cm REC	10-A IC201-34 310mVp-P 0.1V/20.0μ sec. cm REC/PLAY
5-B IC201-12 32mVp-p 20mV/20.0μ sec. cm PLAY	11-A IC201-36 200mVp-p 50mV/20.0μ sec. cm REC
	
6-A IC201-14 850mVp-p 0.2V/20.0μ sec. cm REC	11-B IC201-36 110mVp-p 50mV/20.0μ sec. cm PLAY
	
7-B IC201-17 350mVp-p 0.1V/5.0msec. cm PLAY	12-A IC201-38 810mVp-P 0.2V/20.0μ sec. cm REC
	
8-A IC201-20 400mVp-p 0.1V/20.0μ sec. cm REC	12-B IC201-38 820mVp-P 0.2V/20.0μ sec. cm PLAY
	

DIAGRAM CONFIGURATION	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
AUDIO	5-13 /	5-41
AUDIO-LINEAR	5-22 /	5-39
CAPSTAN MOTOR	5-15 /	-
CYL.MOTOR DRIVE	5-16 /	-
CHARACTER GENERATOR	5-21 /	5-39
FUNCTION SW	5-19 /	5-39
FRONT JACK (For VT-F351A,AW)	5-20 /	5-38
IF	5-12 /	-
LUMINANCE/CHROMA	5-9 /	5-41
PRE/REC AMP	5-33 /	-
POWER SUPPLY (For AW)	5-35 /	5-43
POWER SUPPLY (For A)	5-37 /	5-43
RF CONVERTER	5-20 /	-
REAR JACK (For VT-F350A)	5-25 /	5-39
REAR JACK (For VT-F351A,AW)	5-29 /	5-39
REGULATOR (For AW)	5-36 /	5-44
SERVO	5-17 /	5-39
SENSOR	5-19 /	5-38
SYS.CON./TIMER (For VT-F350A)	5-23 /	5-39
SYS.CON./TIMER (For VT-F351A,AW)	5-27 /	5-39
U-V TUNER	5-31 /	-

IF SHEMATIC DIAGRAM

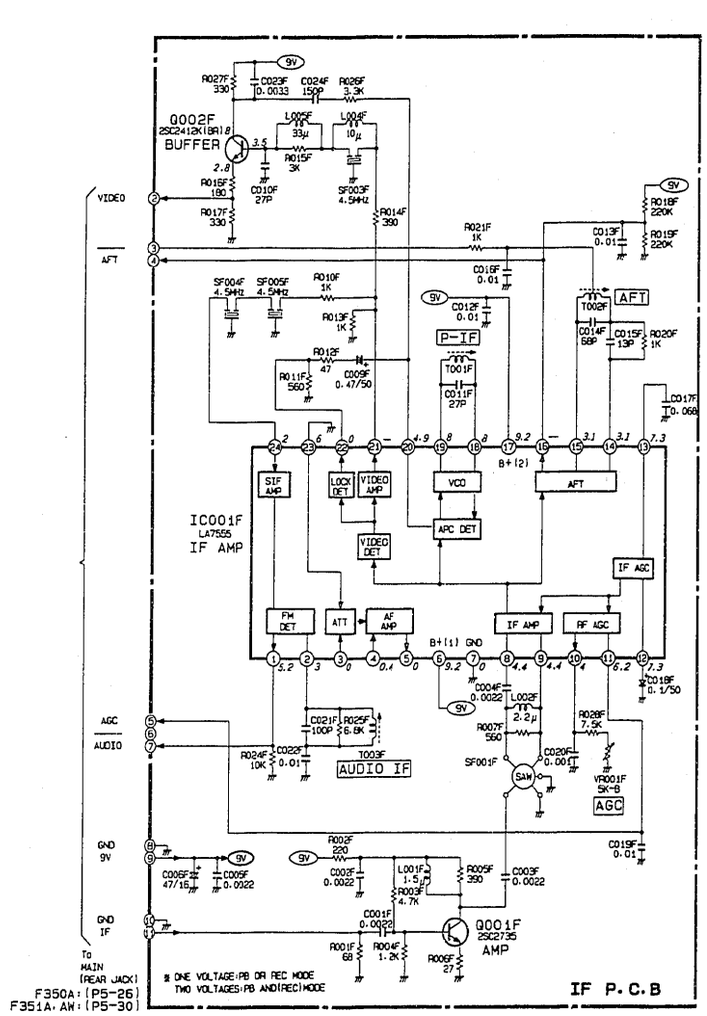


DIAGRAM CONFIGURATION	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
AUDIO	5-13	5-41
AUDIO-LINEAR	5-22	5-39
CAPSTAN MOTOR	5-15	-
CYL.MOTOR DRIVE	5-16	-
CHARACTER GENERATOR	5-21	5-39
FUNCTION SW	5-19	5-39
FRONT JACK (For VT-F351A,AW)	5-20	5-38
IF	5-12	-
LUMINANCE/CHROMA	5-9	5-41
PRE/REC AMP	5-33	-
POWER SUPPLY (For AW)	5-35	5-43
POWER SUPPLY (For A)	5-37	5-43
RF CONVERTER	5-20	-
REAR JACK (For VT-F350A)	5-25	5-39
REAR JACK (For VT-F351A,AW)	5-29	5-39
REGULATOR (For AW)	5-36	5-44
SERVO	5-17	5-39
SENSOR	5-19	5-38
SYS.CON./TIMER (for VT-F350A)	5-23	5-39
SYS.CON./TIMER (For VT-F351A,AW)	5-27	5-39
U-V TUNER	5-31	-

AUDIO SCHEMATIC DIAGRAM

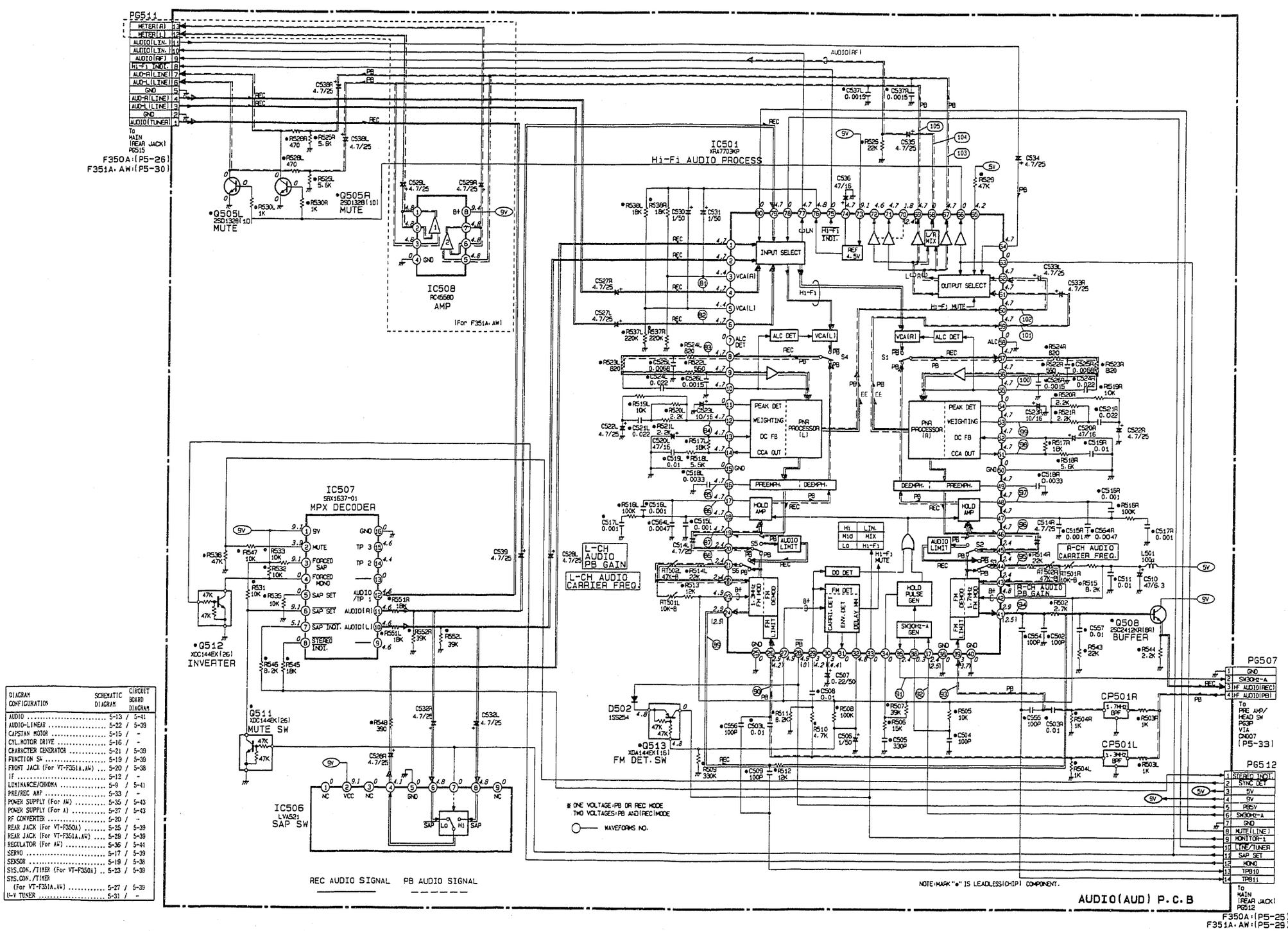
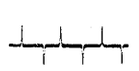
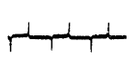
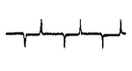
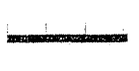
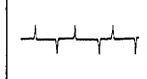
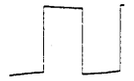
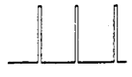
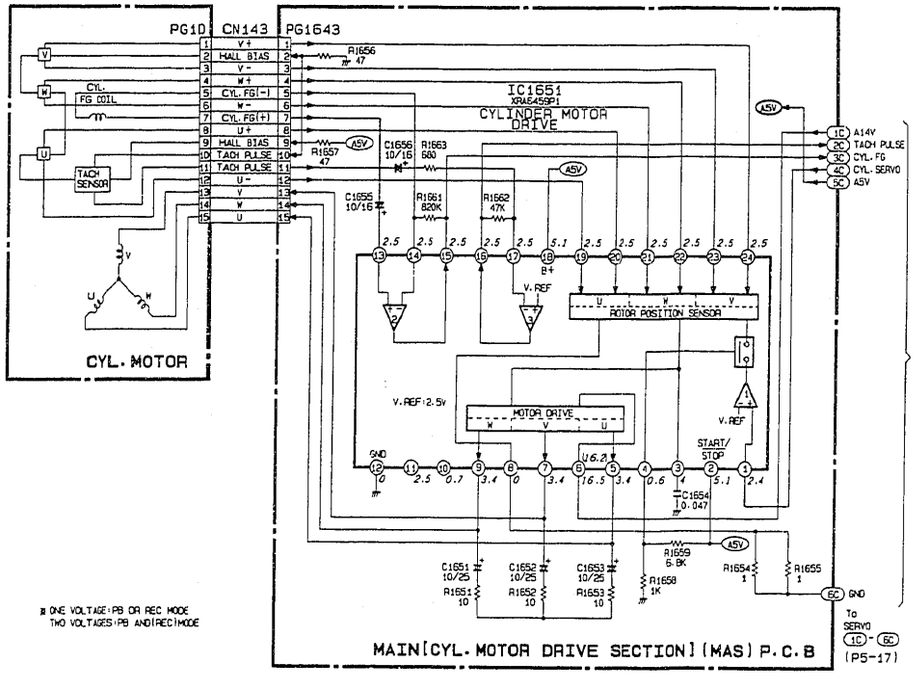


DIAGRAM CONFIGURATION	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
AUDIO	5-13	5-41
AUDIO-LINEAR	5-22	5-39
CAPSTAN MOTOR	5-15	-
CYL.MOTOR DRIVE	5-16	-
CHARACTER GENERATOR	5-21	5-39
FUNCTION SW	5-19	5-39
FRONT JACK (For VT-F351A,AW)	5-20	5-38
IF	5-12	-
LUMINANCE/CHROMA	5-8	5-41
PRE/REC AMP	5-33	-
POWER SUPPLY (For AW)	5-35	5-43
POWER SUPPLY (For A)	5-37	5-43
RF CONVERTER	5-20	-
REAR JACK (For VT-F350A)	5-25	5-39
REAR JACK (For VT-F351A,AW)	5-29	5-39
REGULATOR (For AW)	5-36	5-44
SERVO	5-17	5-39
SENSOR	5-18	5-38
SYS.CON./TIMER (For VT-F350A)	5-23	5-39
SYS.CON./TIMER (For VT-F351A,AW)	5-27	5-39
U-V TUNER	5-31	-

SERVO WAVEFORMS

S1-AIC601 TP604 1.9Vp-p 0.5V/10.0msec.cm REC/PLAY		S4-AIC601-1 5.8Vp-p 2V/10.0msec.cm REC/PLAY	S5-AIC601-6 2.8Vp-p 0.5V/2.0msec.cm REC/PLAY	S6-AIC601-7 2.3Vp-p 0.5V/10.0msec.cm REC/PLAY	S7-AIC601-9 4.0Vp-p 1V/1.0msec.cm REC/PLAY
					
S8-AIC601-2e 6.5Vp-p 2V/10.0msec.cm REC	S9-AIC601-3D 2.6Vp-p 1V/10.0msec.cm REC	S0-AIC601-34 680mVp-p 0.2V/10.0msec.cm REC	S0-BIC601-34 2.2Vp-p 1V/10.0msec.cm PLAY	S1-AIC601-35 660mVp-p 0.2V/10.0msec.cm REC	S1-BIC601-35 2.1Vp-p 1V/10.0msec.cm PLAY
					
S2-AIC601-3e 660mVp-p 0.2V/10.0msec.cm REC	S2-BIC601-3e 2.2Vp-p 1V/10.0msec.cm PLAY	S3-AIC601-39 5.6Vp-p 1V/10.0msec.cm REC/PLAY	S4-AIC601-42 510mVp-p 0.1V/200μsec.cm REC/PLAY	S5-AIC601-45 5.8Vp-p 1V/10.0msec.cm REC/PLAY	S6-AIC601-50 5.2Vp-p 1V/20.0μsec.cm REC/PLAY
					
S7-AIC601-55 5.7Vp-p 1V/500μsec.cm REC/PLAY					

CYL. MOTOR DRIVE SCHEMATIC DIAGRAM



CAPSTAN MOTOR SCHEMATIC DIAGRAM (DDV6-7C)

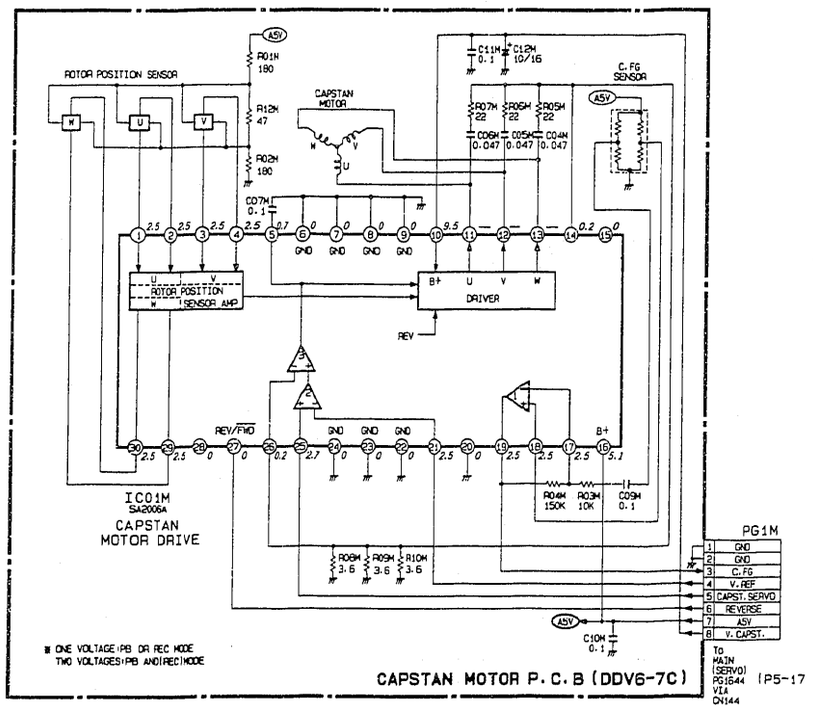
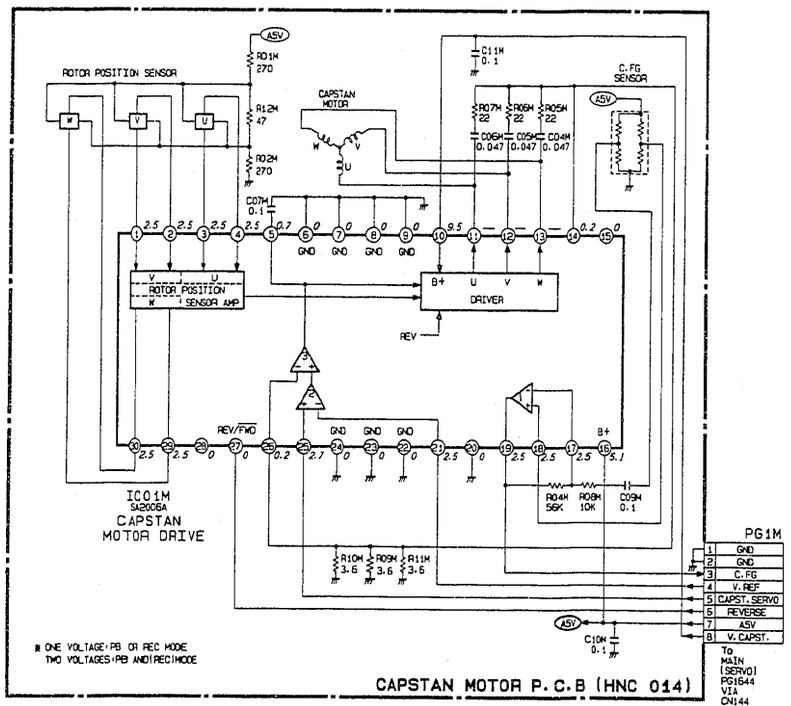


DIAGRAM CONFIGURATION	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
AUDIO	5-13	5-41
AUDIO-LINEAR	5-22	5-39
CAPSTAN MOTOR	5-15	-
CYL.MOTOR DRIVE	5-16	-
CHARACTER GENERATOR	5-21	5-39
FUNCTION SW	5-19	5-39
FRONT JACK (For VT-F351A,AW)	5-20	5-38
IF	5-12	-
LUMINANCE/CHROMA	5-9	5-41
PRE/REC AMP	5-33	-
POWER SUPPLY (For AW)	5-35	5-43
POWER SUPPLY (For A)	5-37	5-43
RF CONVERTER	5-20	-
REAR JACK (For VT-F350A)	5-25	5-39
REAR JACK (For VT-F351A,AW)	5-29	5-39
REGULATOR (For AW)	5-36	5-44
SERVO	5-17	5-39
SENSOR	5-19	5-38
SYS.CON./TIMER (For VT-F350A)	5-23	5-39
SYS.CON./TIMER (For VT-F351A,AW)	5-27	5-39
U-V TUNER	5-31	-

CAPSTAN MOTOR SCHEMATIC DIAGRAM (HNC 014)



SERVO SCHEMATIC DIAGRAM

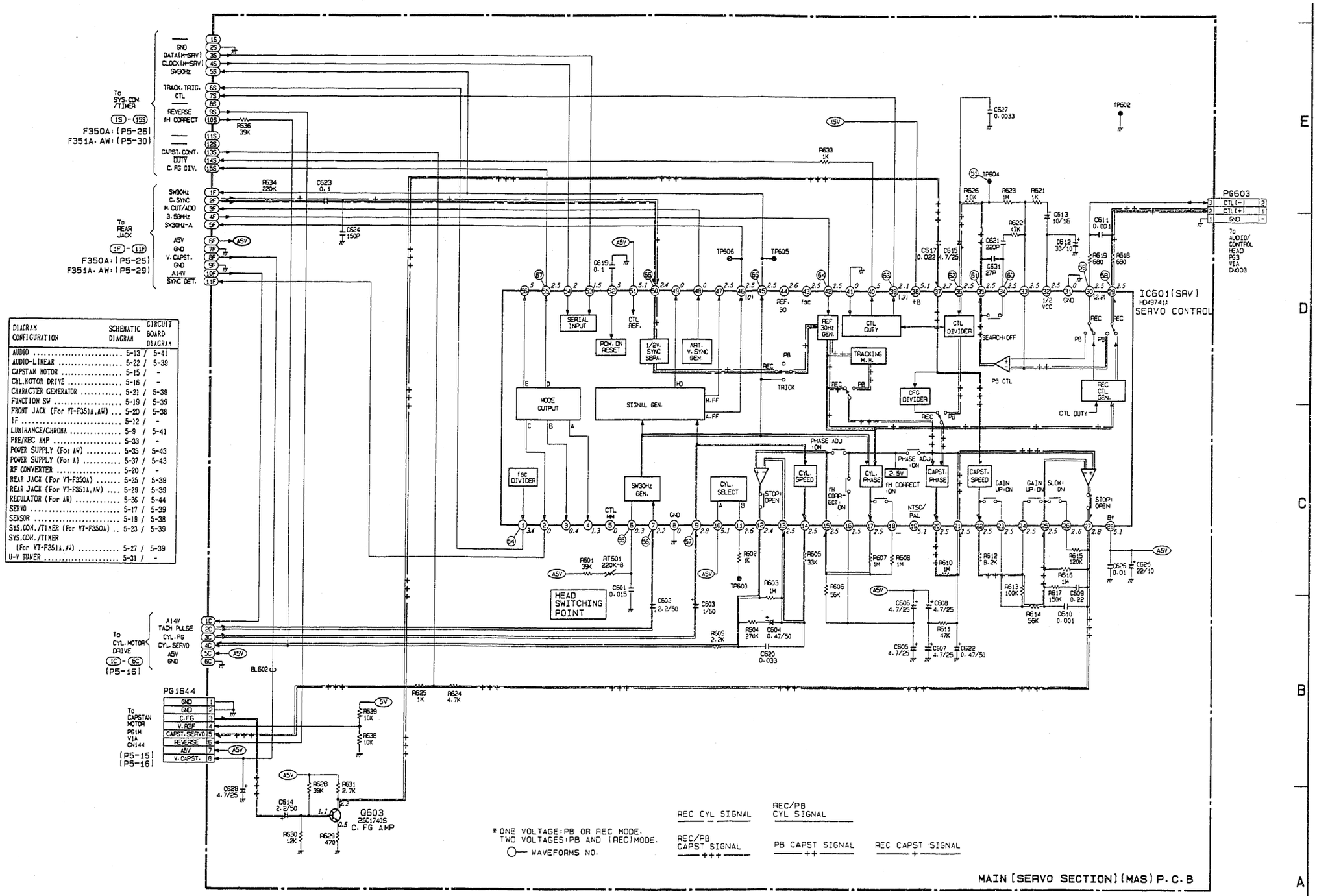
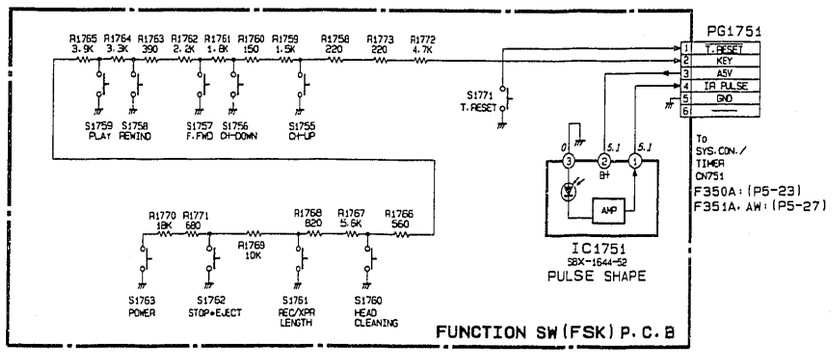
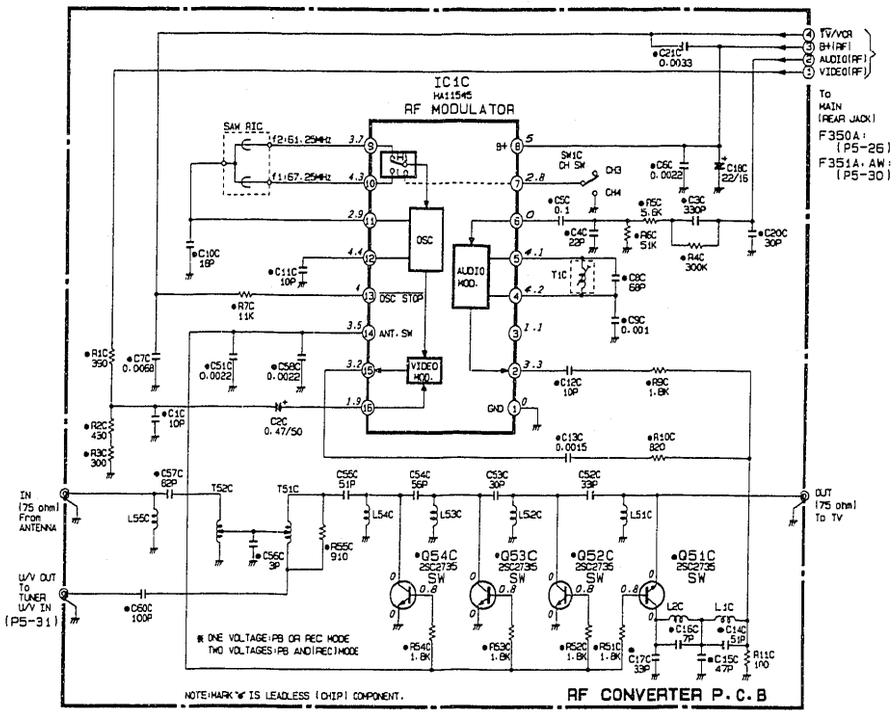


DIAGRAM CONFIGURATION	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
AUDIO	5-13	5-41
AUDIO-LINEAR	5-22	5-38
CAPSTAN MOTOR	5-15	-
CYL.MOTOR DRIVE	5-16	-
CHARACTER GENERATOR	5-21	5-39
FUNCTION SW	5-19	5-39
FRONT JACK (For VT-F351A,AW)	5-20	5-38
IF	5-12	-
LUMINANCE/CHROMA	5-9	5-41
PRE/REC AMP	5-33	-
POWER SUPPLY (For AW)	5-35	5-43
POWER SUPPLY (For A)	5-37	5-43
RF CONVERTER	5-20	-
REAR JACK (For VT-F350A)	5-25	5-39
REAR JACK (For VT-F351A,AW)	5-29	5-39
REGULATOR (For AW)	5-36	5-44
SERVO	5-17	5-39
SENSOR	5-19	5-38
SYS.CON./TIMER (For VT-F350A)	5-23	5-39
SYS.CON./TIMER (For VT-F351A,AW)	5-27	5-39
U-V TUNER	5-31	-

FUNCTION SW SCHEMATIC DIAGRAM

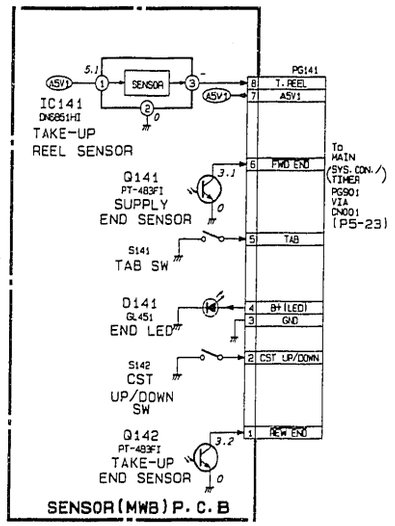


RF CONVERTER SCHEMATIC DIAGRAM

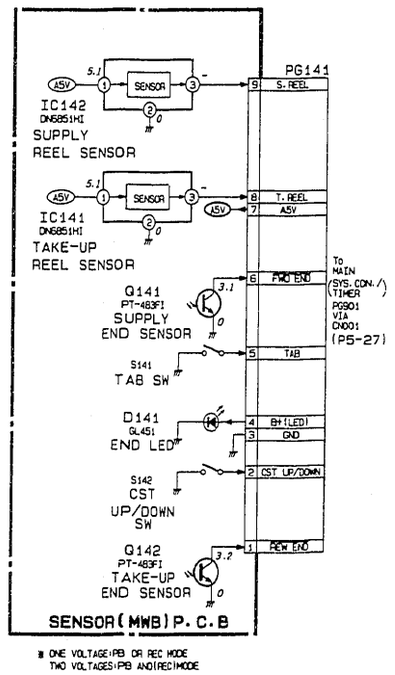


SENSOR SCHEMATIC DIAGRAM

(For F350A)



(For F351A, AW)



FRONT JACK SCHEMATIC DIAGRAM

(For F351A, AW)

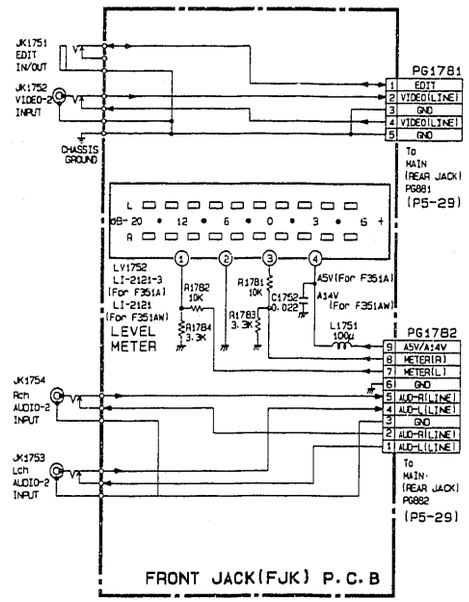


DIAGRAM CONFIGURATION	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
AUDIO	5-13 /	5-41
AUDIO-LINEAR	5-22 /	5-39
CAPSTAN MOTOR	5-15 /	-
CYL.MOTOR DRIVE	5-16 /	-
CHARACTER GENERATOR	5-21 /	5-39
FUNCTION SW	5-19 /	5-39
FRONT JACK (For VT-F351A,AW)	5-20 /	5-38
IF	5-12 /	-
LUMINANCE/CHROMA	5-9 /	5-41
PRE/REC AMP	5-33 /	-
POWER SUPPLY (For AW)	5-35 /	5-43
POWER SUPPLY (For A)	5-37 /	5-43
RF CONVERTER	5-20 /	-
REAR JACK (For VT-F350A)	5-25 /	5-39
REAR JACK (For VT-F351A,AW)	5-29 /	5-39
REGULATOR (For AW)	5-36 /	5-44
SERVO	5-17 /	5-39
SENSOR	5-19 /	5-38
SYS.CON./TIMER (For VT-F350A)	5-23 /	5-39
SYS.CON./TIMER (For VT-F351A,AW)	5-27 /	5-39
U-V TUNER	5-31 /	-

CHARACTER GENERATOR SCHEMATIC DIAGRAM

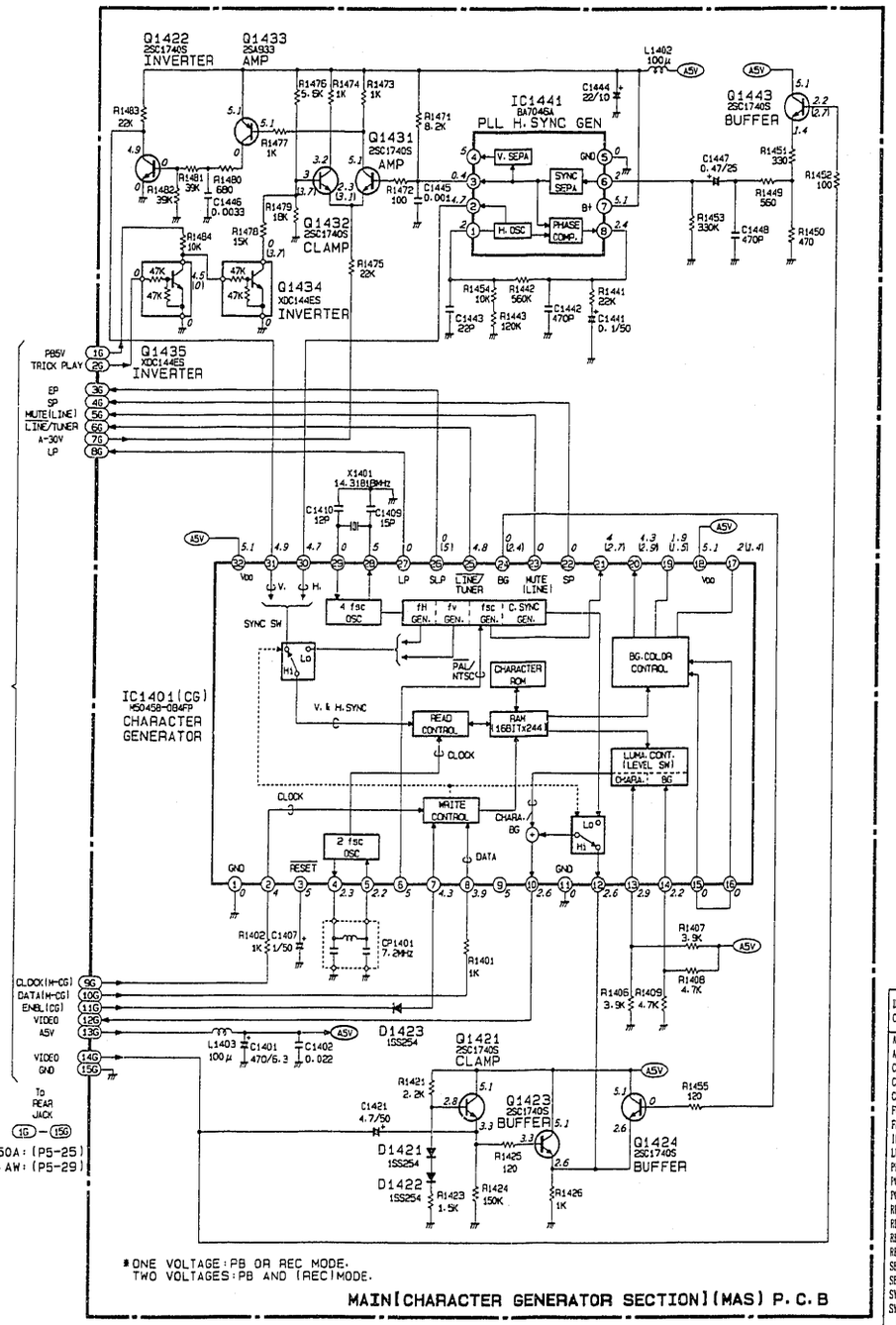
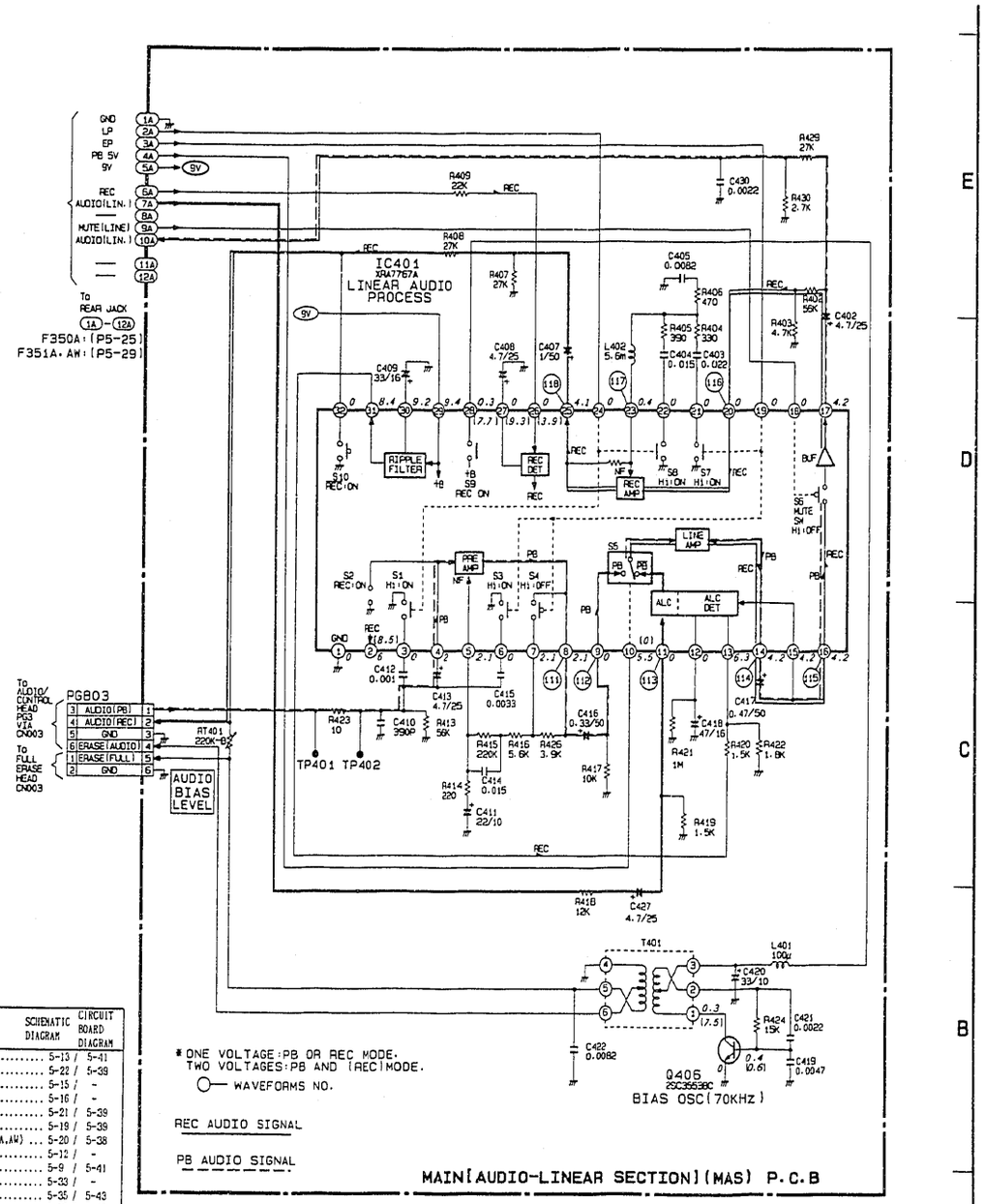
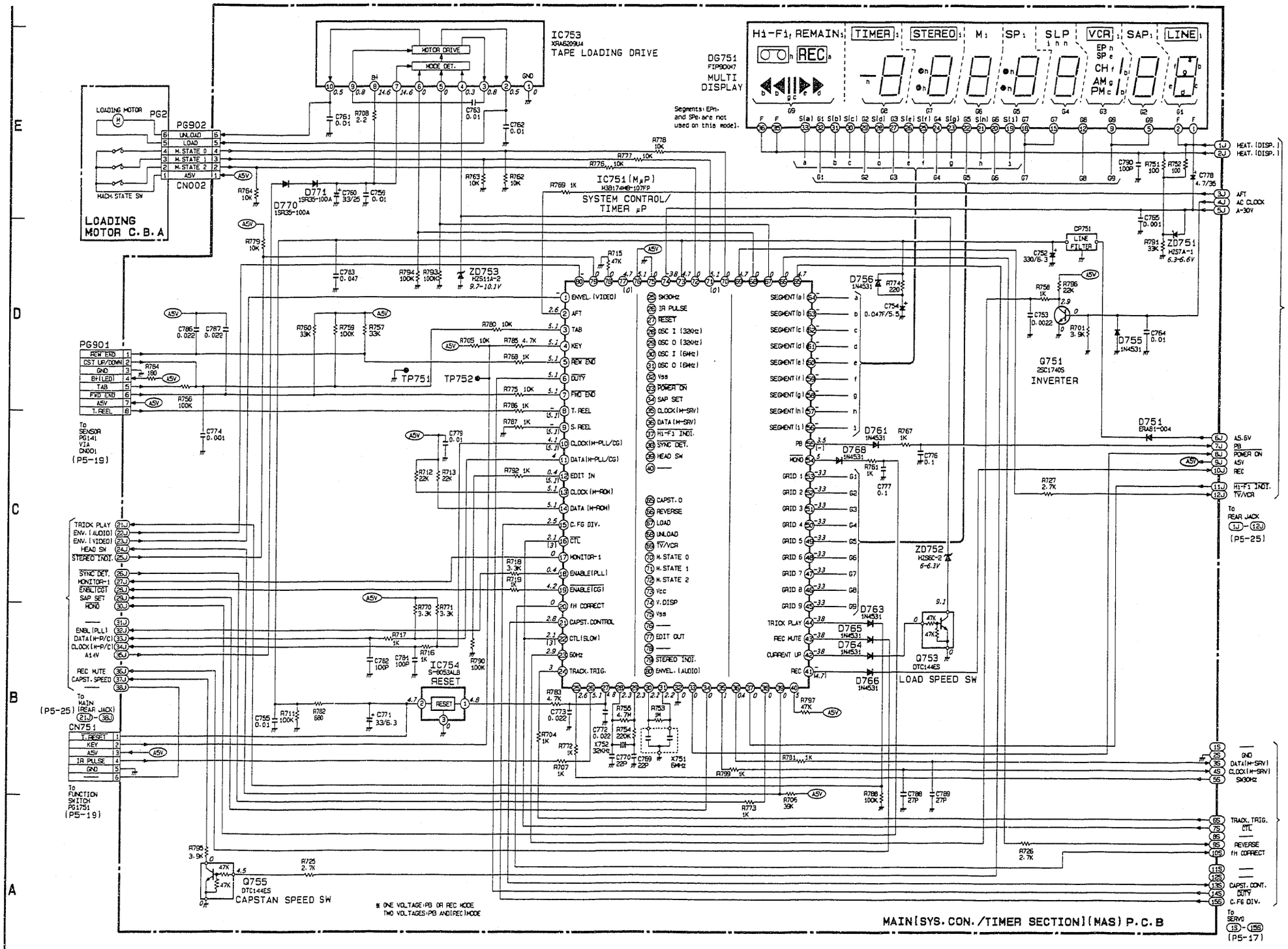


DIAGRAM CONFIGURATION	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
AUDIO	5-13 /	5-41
AUDIO-LINEAR	5-22 /	5-39
CAPSTAN MOTOR	5-15 /	-
CYL.MOTOR DRIVE	5-16 /	-
CHARACTER GENERATOR	5-21 /	5-39
FUNCTION SW	5-19 /	5-39
FRONT JACK (For VT-F351A,AW)	5-20 /	5-38
IF	5-12 /	-
LUMINANCE/CHROMA	5-9 /	5-41
PRE/REC AMP	5-33 /	-
POWER SUPPLY (For AW)	5-35 /	5-43
POWER SUPPLY (For A)	5-37 /	5-43
RF CONVERTER	5-20 /	-
REAR JACK (For VT-F350A)	5-25 /	5-39
REAR JACK (For VT-F351A,AW)	5-29 /	5-39
REGULATOR (For AW)	5-36 /	5-44
SERVO	5-17 /	5-39
SENSOR	5-19 /	5-38
SYS.CON./TIMER (For VT-F350A)	5-23 /	5-39
SYS.CON./TIMER (For VT-F351A,AW)	5-27 /	5-39
U-V TUNER	5-31 /	-

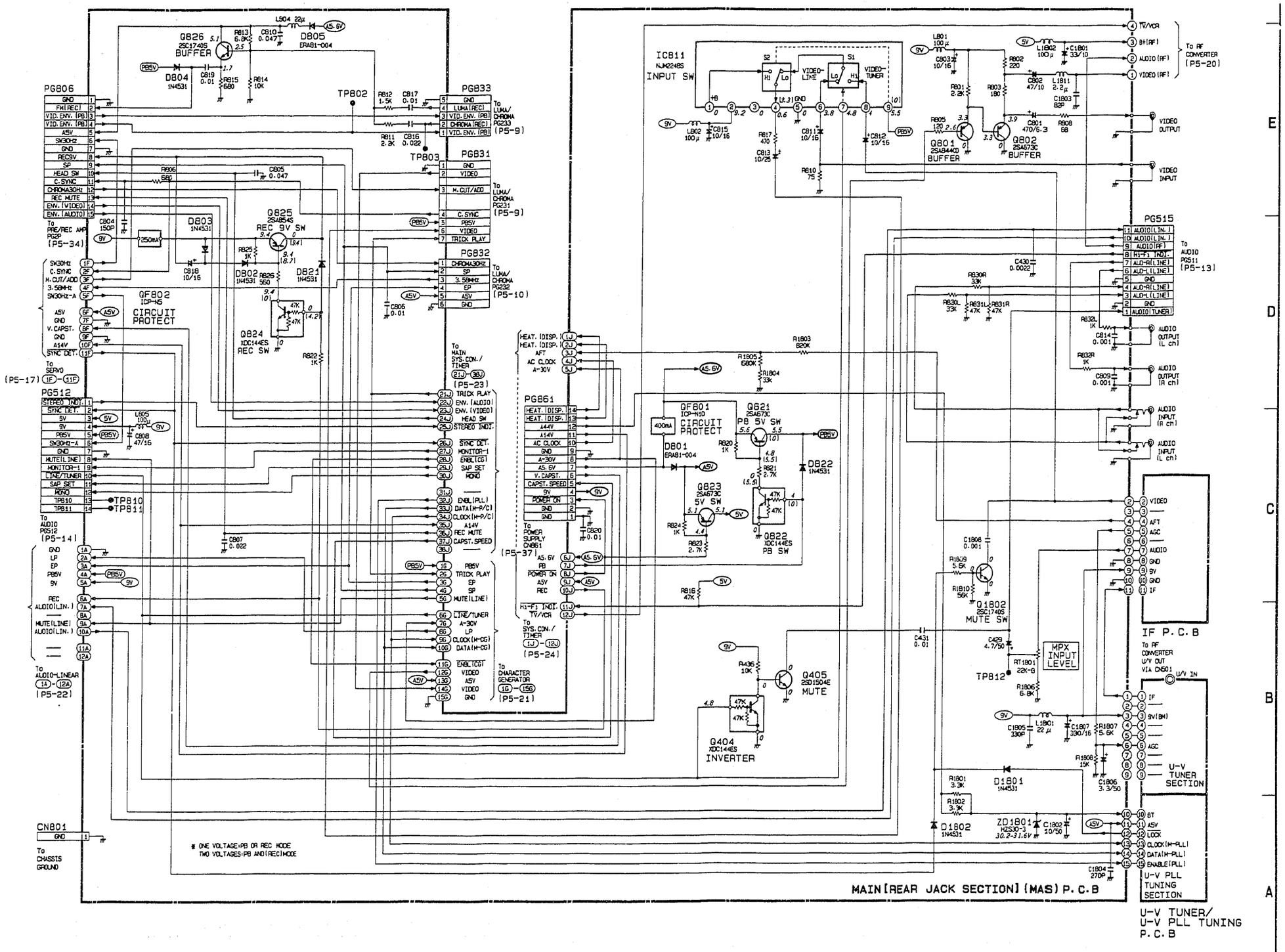
AUDIO-LINEAR SCHEMATIC DIAGRAM



SYS. CON. /TIMER SCHEMATIC DIAGRAM (For F350A)



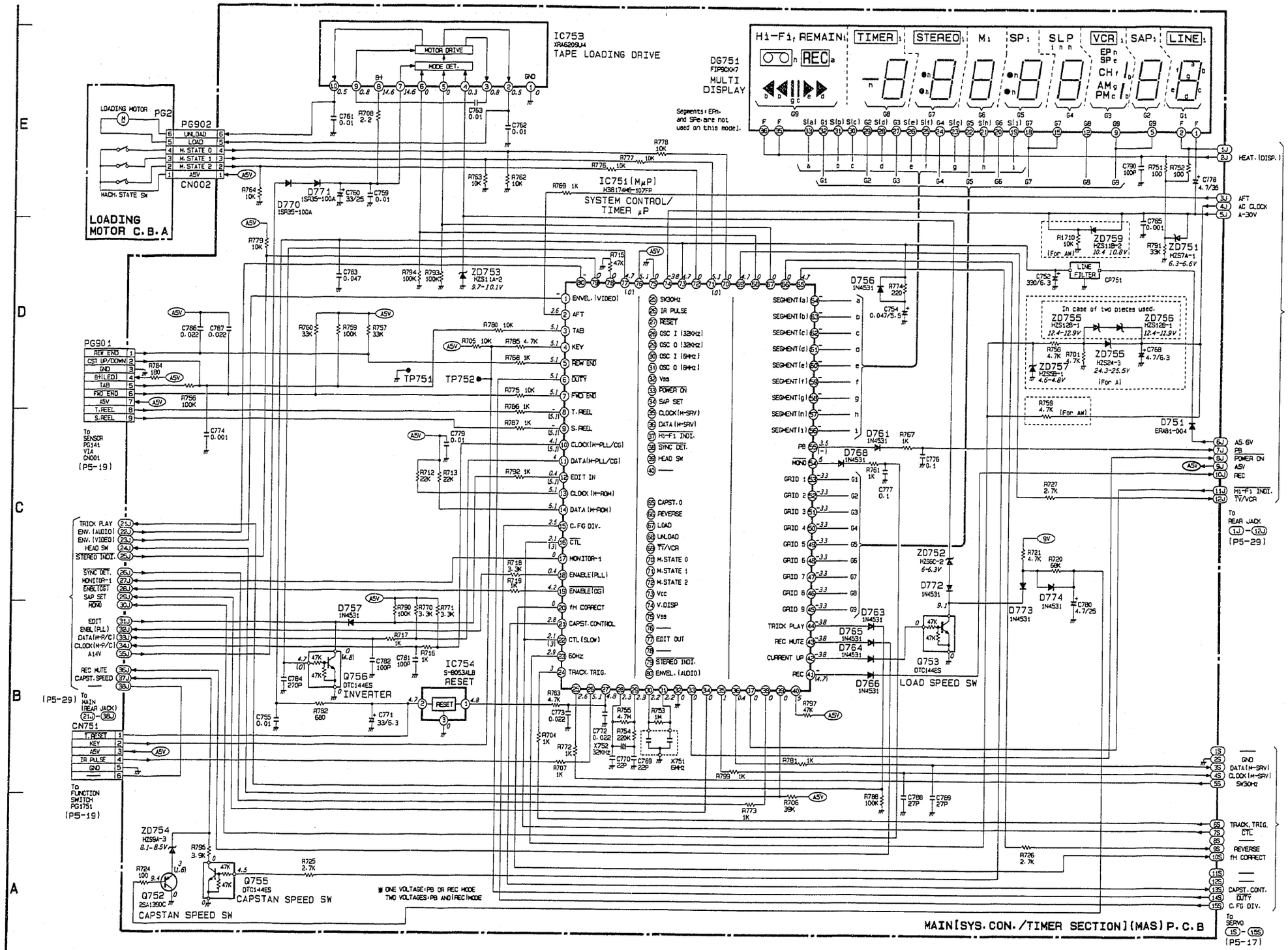
REAR JACK SCHEMATIC DIAGRAM (For F350A)



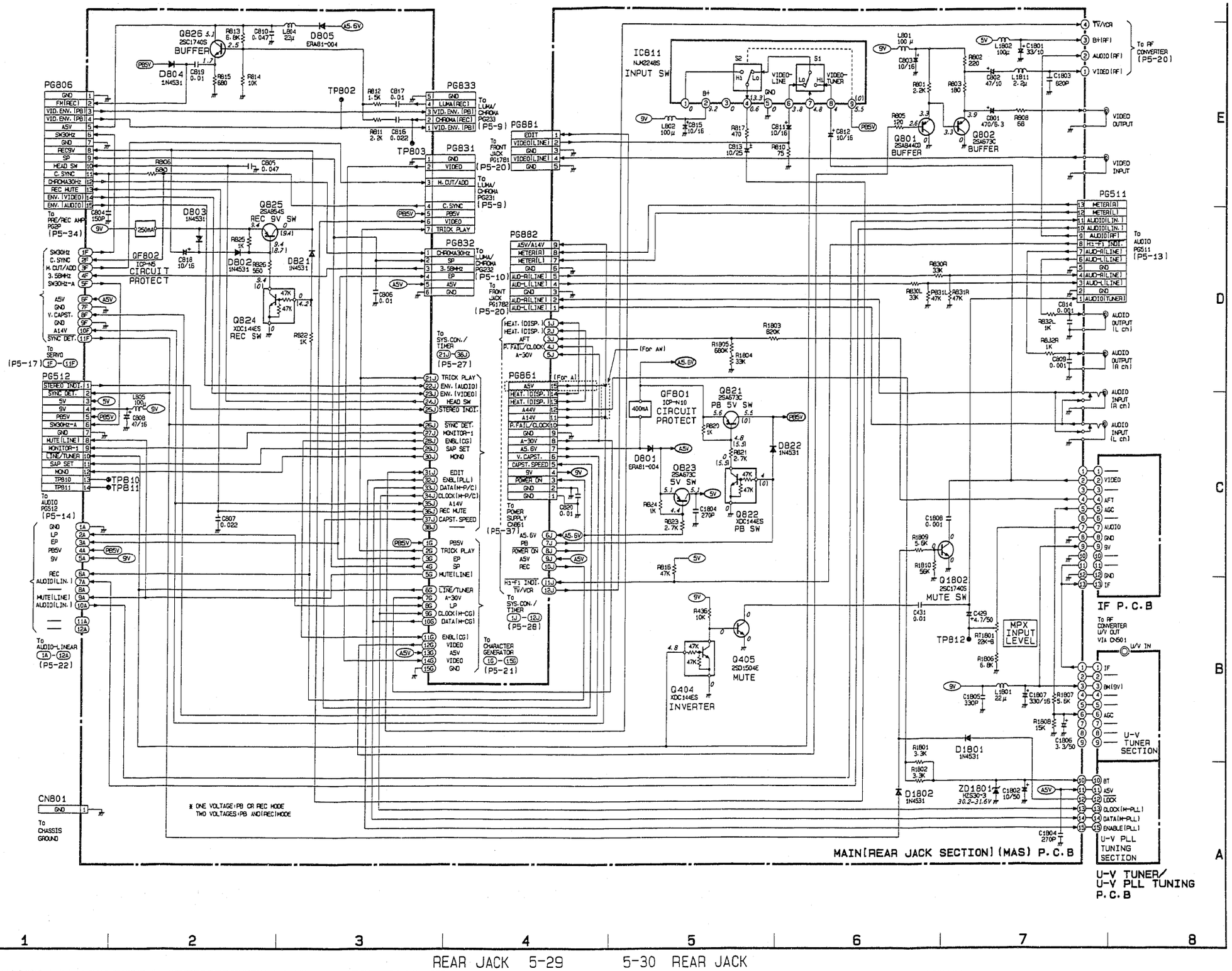
1 2 3 4 5 6 7 8

REAR JACK 5-25 5-26 REAR JACK

SYS. CON. /TIMER SCHEMATIC DIAGRAM (For F351A, AW)



REAR JACK SCHEMATIC DIAGRAM (For F351A, AW)



REAR JACK 5-29 5-30 REAR JACK

U-V TUNER SCHEMATIC DIAGRAM

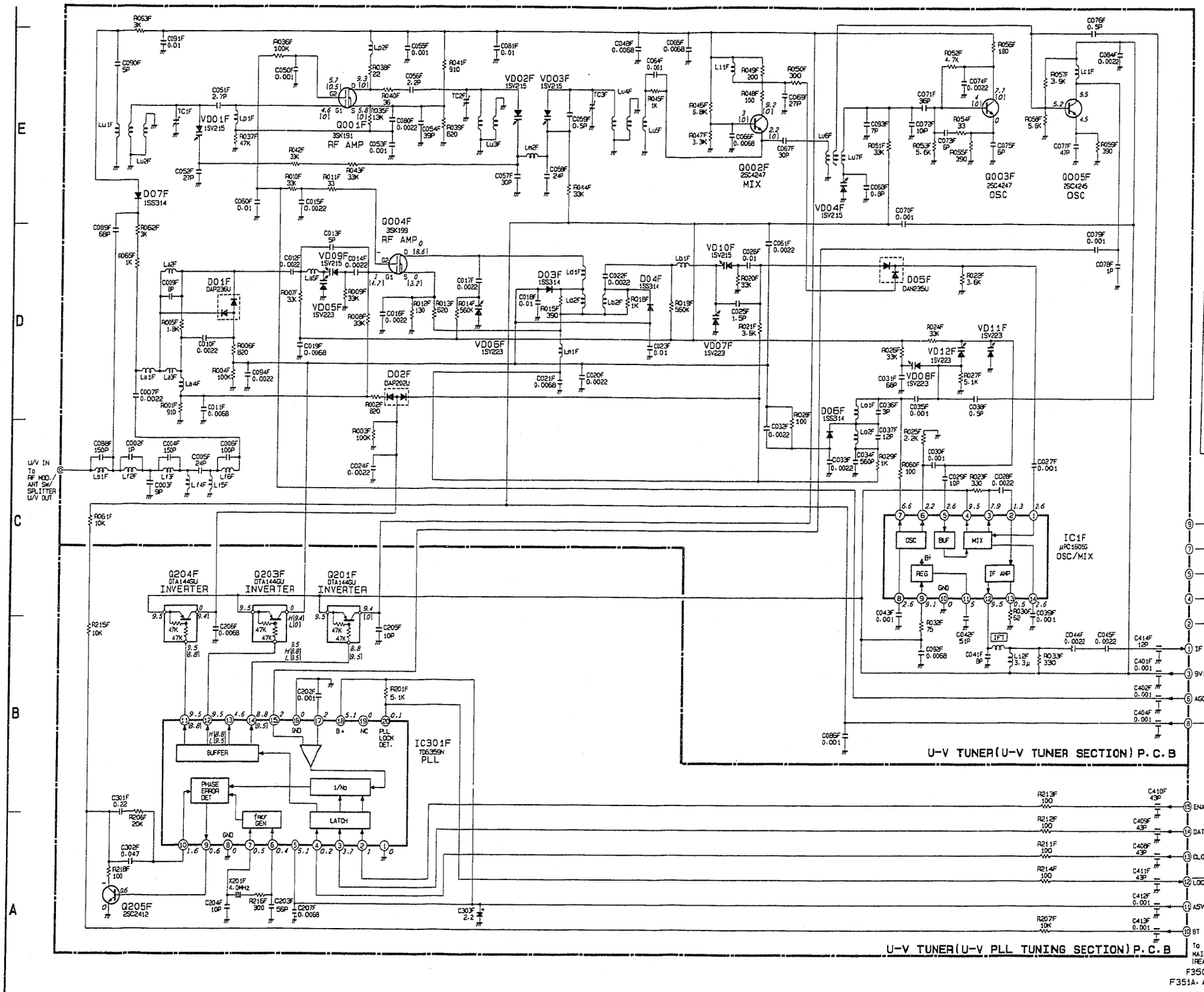


DIAGRAM CONFIGURATION	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
AUDIO	5-13 /	5-41
AUDIO-LINEAR	5-22 /	5-39
CAPSTAN MOTOR	5-15 /	-
CYL.MOTOR DRIVE	5-16 /	-
CHARACTER GENERATOR	5-21 /	5-39
FUNCTION SW	5-19 /	5-39
FRONT JACK (For VT-F351A,AW)	5-20 /	5-38
IF	5-12 /	-
LUMINANCE/CHROMA	5-9 /	5-41
PRE/REC AMP	5-33 /	-
POWER SUPPLY (For AW)	5-35 /	5-43
POWER SUPPLY (For A)	5-37 /	5-43
RF CONVERTER	5-20 /	-
REAR JACK (For VT-F350A)	5-25 /	5-39
REAR JACK (For VT-F351A,AW)	5-29 /	5-39
REGULATOR (For AW)	5-36 /	5-44
SERVO	5-17 /	5-39
SENSOR	5-18 /	5-38
SYS.CON./TIMER (For VT-F350A)	5-23 /	5-39
SYS.CON./TIMER (For VT-F351A,AW)	5-27 /	5-38
U-V TUNER	5-31 /	-

PRE/REC AMP SCHEMATIC DIAGRAM

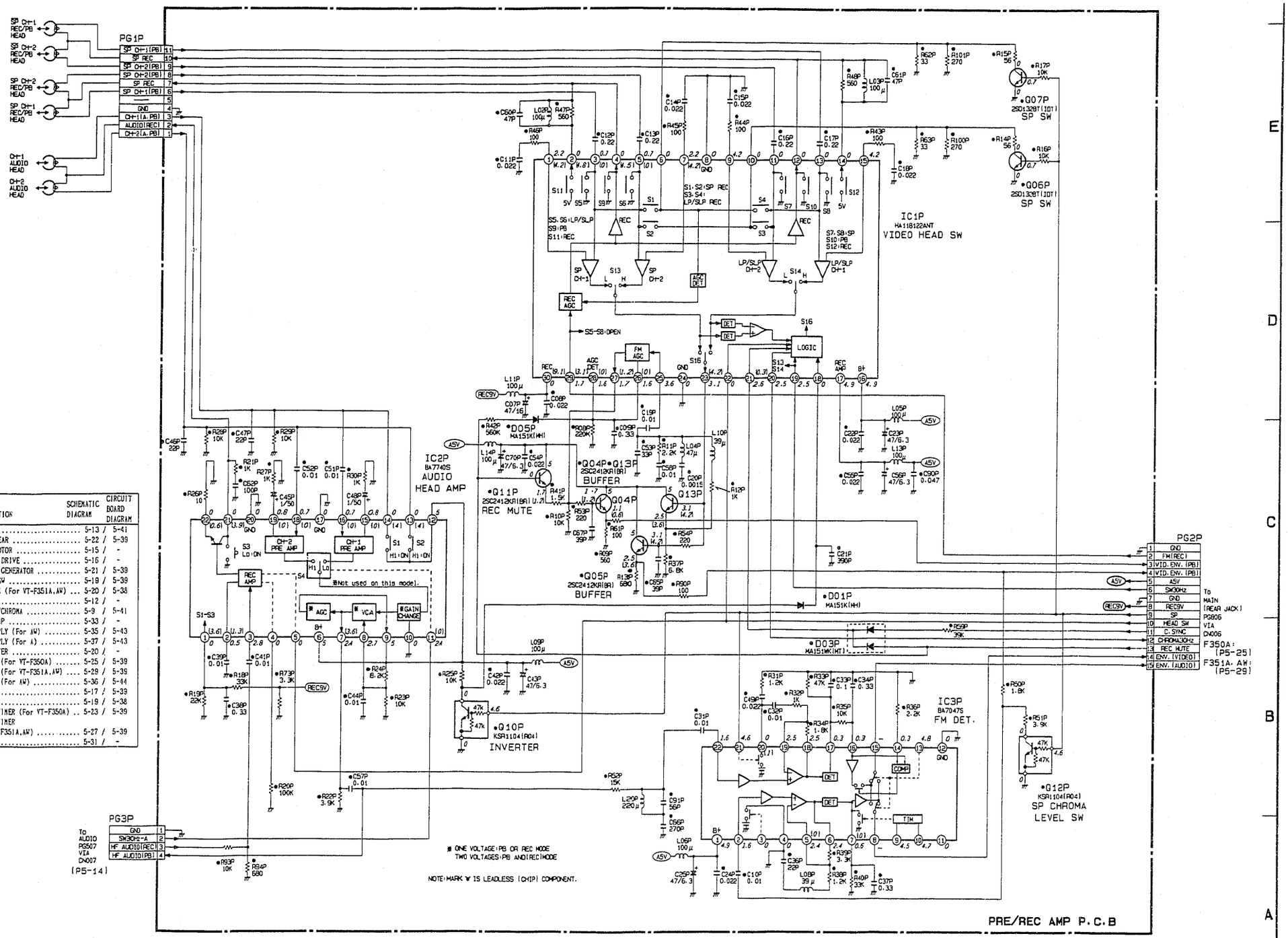
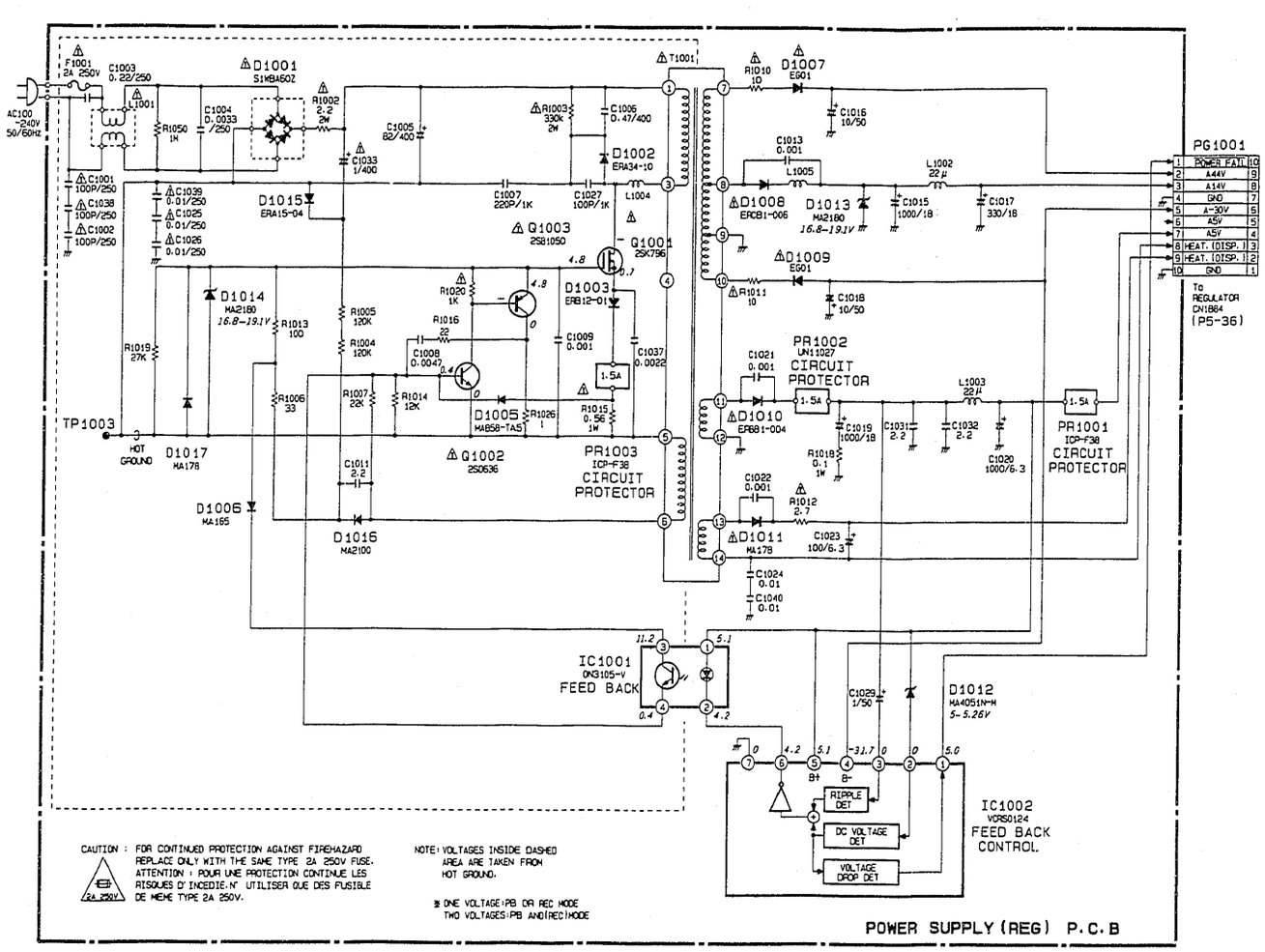


DIAGRAM CONFIGURATION	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
AUDIO	5-13 /	5-41
AUDIO-LINEAR	5-22 /	5-39
CAPSTAN MOTOR	5-15 /	-
CYL.MOTOR DRIVE	5-16 /	-
CHARACTER GENERATOR	5-21 /	5-39
FUNCTION SW	5-19 /	5-39
FRONT JACK (For VT-F351A,AW)	5-20 /	5-38
IF	5-12 /	-
LUMINANCE/CHROMA	5-9 /	5-41
PRE/REC AMP	5-33 /	-
POWER SUPPLY (For AW)	5-35 /	5-43
POWER SUPPLY (For A)	5-37 /	5-43
RF CONVERTER	5-20 /	-
REAR JACK (For VT-F350A)	5-25 /	5-39
REAR JACK (For VT-F351A,AW)	5-29 /	5-39
REGULATOR (For AW)	5-36 /	5-44
SERVO	5-17 /	5-39
SENSOR	5-19 /	5-38
SYS.CON./TIMER (For VT-F350A)	5-23 /	5-39
SYS.CON./TIMER (For VT-F351A,AW)	5-27 /	5-39
U-V TUNER	5-31 /	-

POWER SUPPLY SCHEMATIC DIAGRAM (For F351AW)



REGULATOR SCHEMATIC DIAGRAM (For F351AW)

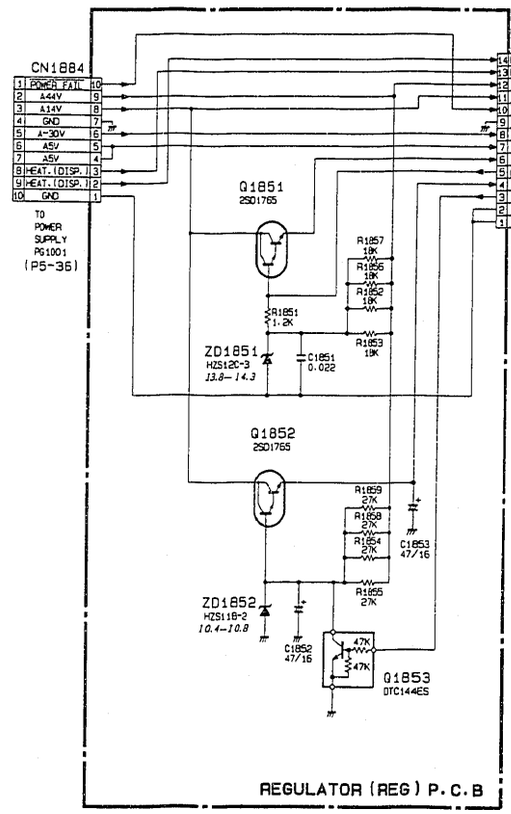
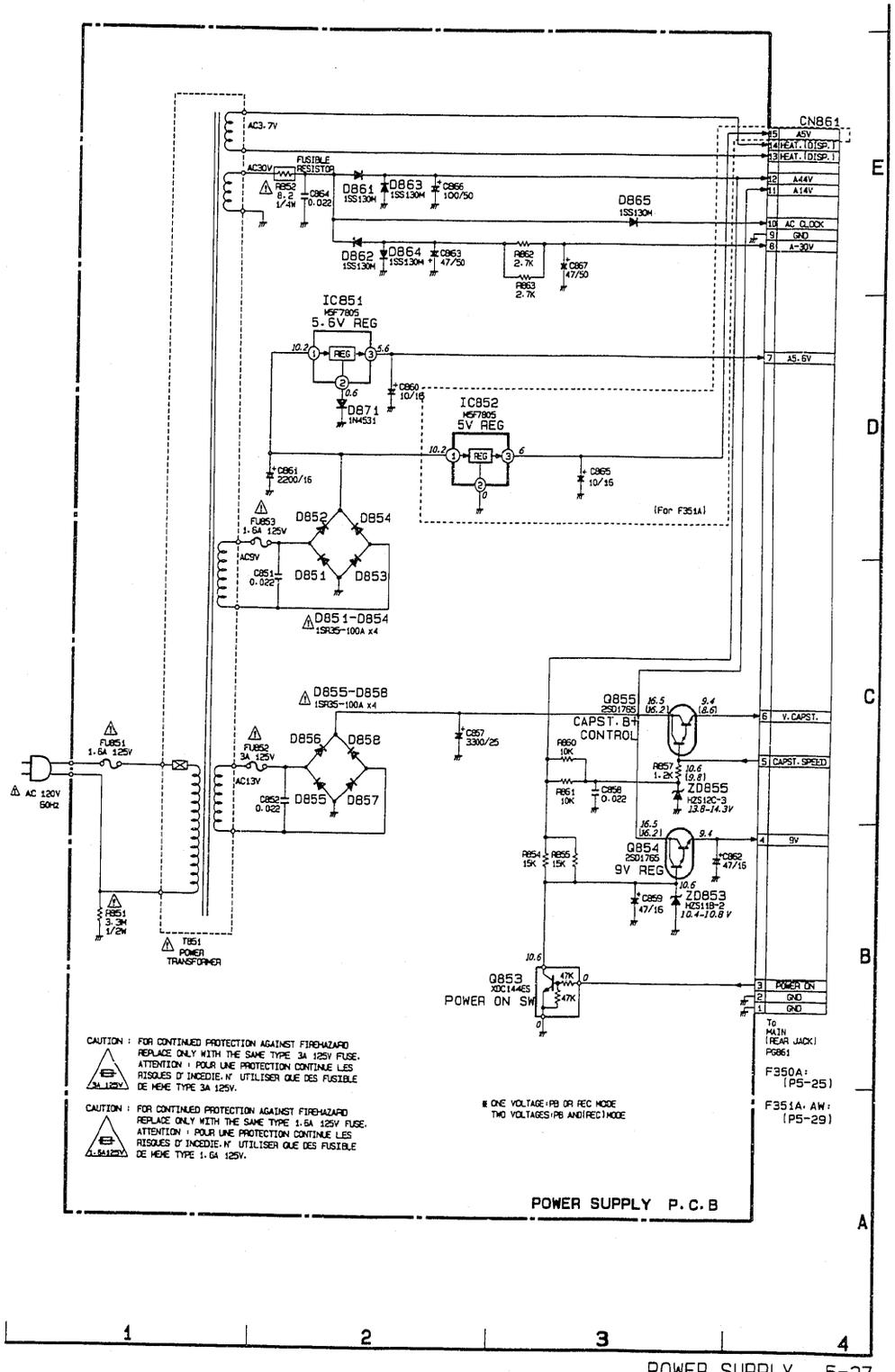
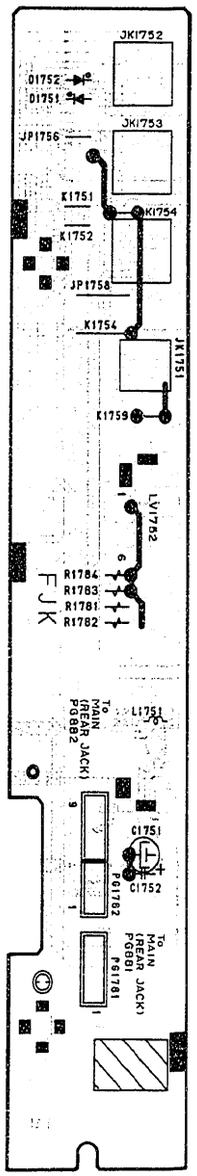


DIAGRAM CONFIGURATION	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
AUDIO	5-13	5-41
AUDIO-LINEAR	5-22	5-39
CAPSTAN MOTOR	5-15	-
CYL.MOTOR DRIVE	5-16	-
CHARACTER GENERATOR	5-21	5-39
FUNCTION SW	5-19	5-39
FRONT JACK (For VT-F351A,AW)	5-20	5-38
IF	5-12	-
LUMINANCE/CHROMA	5-9	5-41
PRE/REC AMP	5-33	-
POWER SUPPLY (For AW)	5-35	5-43
POWER SUPPLY (For A)	5-37	5-43
RF CONVERTER	5-20	-
REAR JACK (For VT-F350A)	5-25	5-39
REAR JACK (For VT-F351A,AW)	5-28	5-39
REGULATOR (For AW)	5-36	5-44
SERVO	5-17	5-39
SENSOR	5-19	5-38
SYS.CON./TIMER (For VT-F350A)	5-23	5-39
SYS.CON./TIMER (For VT-F351A,AW)	5-27	5-39
U-V TUNER	5-31	-

POWER SUPPLY SCHEMATIC DIAGRAM
(For F350A, F351A)

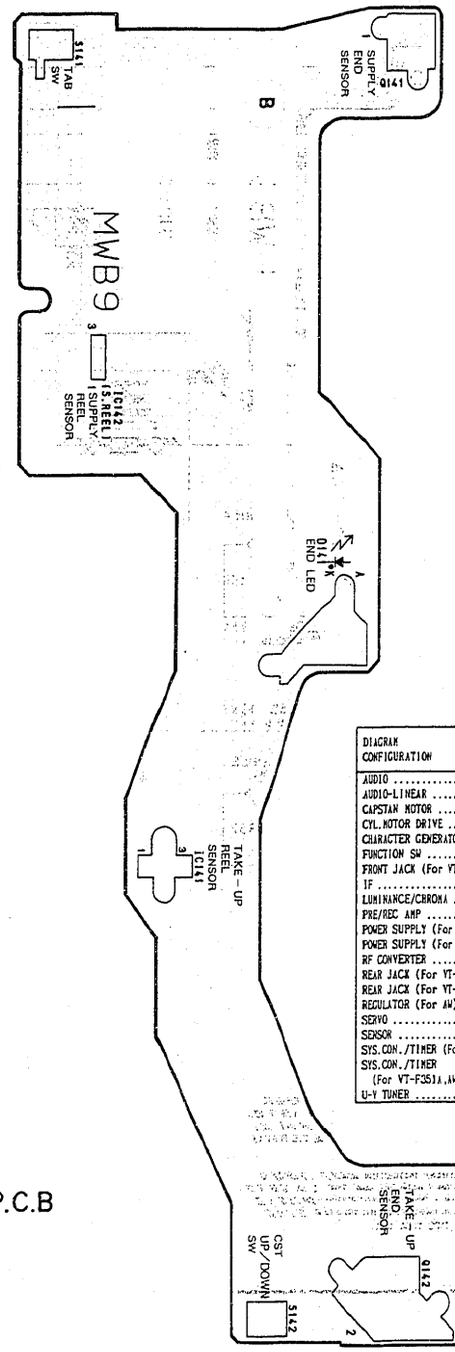


FRONT JACK CIRCUIT BOARD DIAGRAM (For F351A, AW)



FRONT JACK(FJK)P.C.B
(For F351A, AW)

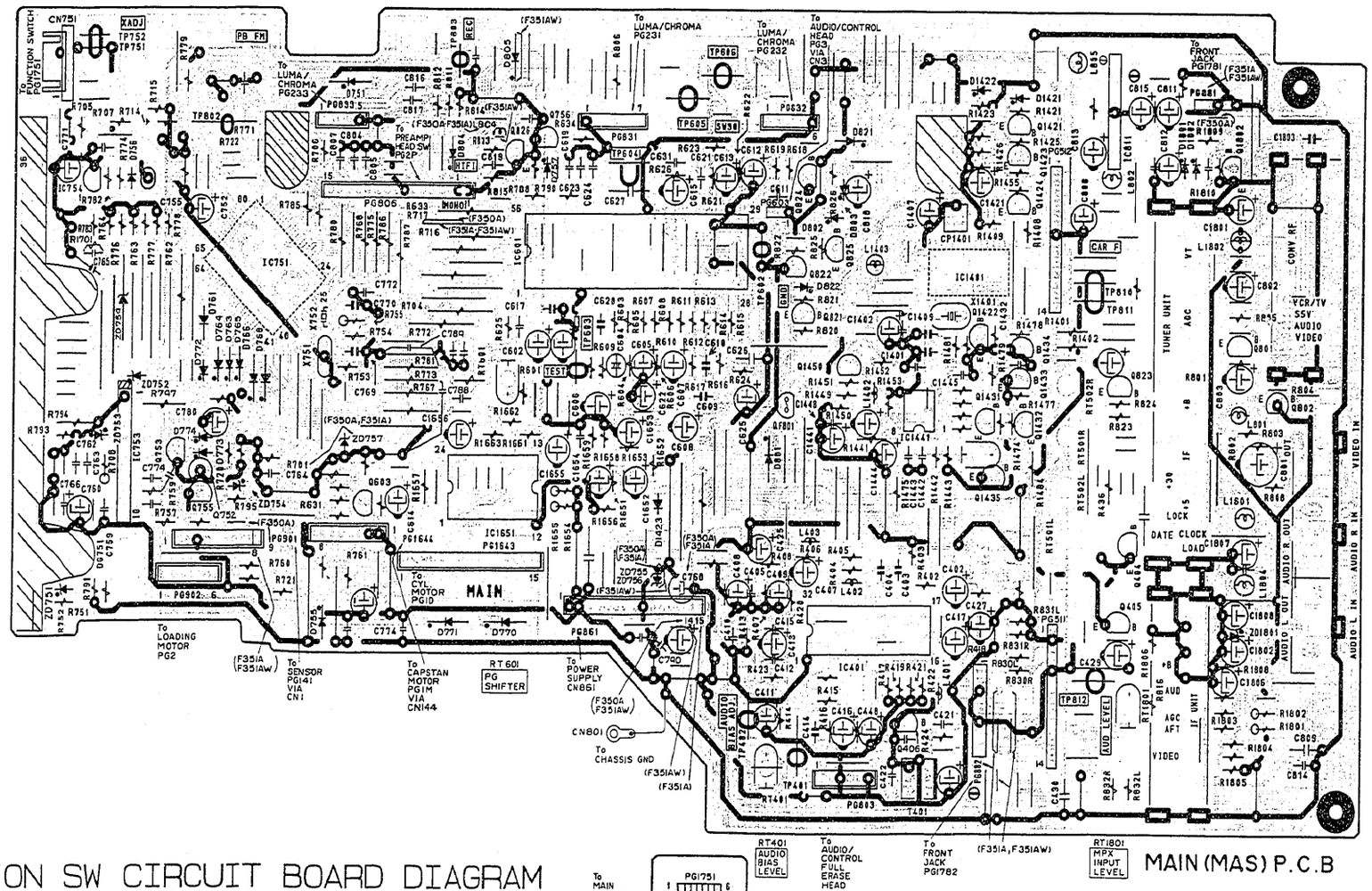
SENSOR CIRCUIT BOARD DIAGRAM



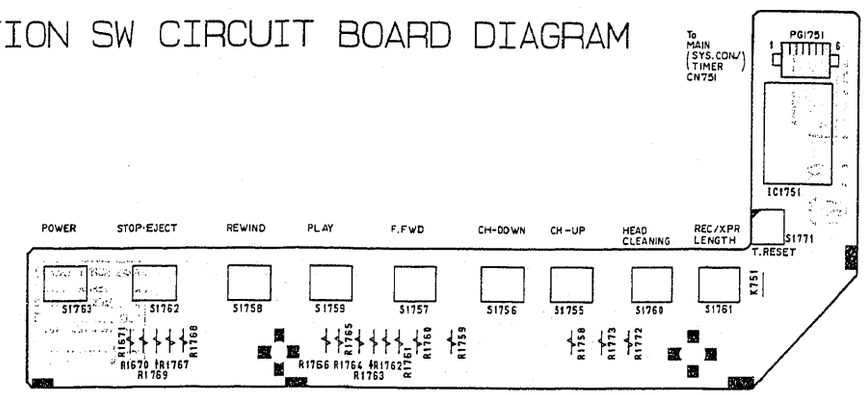
SENSOR(MWB)P.C.B

DIAGRAM CONFIGURATION	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
AUDIO	5-13 /	5-41
AUDIO-LINEAR	5-22 /	5-39
CAPSTAN MOTOR	5-15 /	-
CYL.MOTOR DRIVE	5-16 /	-
CHARACTER GENERATOR	5-21 /	5-39
FUNCTION SW	5-19 /	5-39
FRONT JACK (For VT-F351A,AW)	5-20 /	5-38
IF	5-12 /	-
LUMINANCE/CHROMA	5-9 /	5-41
PRE/REC AMP	5-33 /	-
POWER SUPPLY (For AW)	5-35 /	5-43
POWER SUPPLY (For A)	5-37 /	5-43
RF CONVERTER	5-20 /	-
REAR JACK (For VT-F350A)	5-25 /	5-39
REAR JACK (For VT-F351A,AW)	5-29 /	5-39
REGULATOR (For AW)	5-36 /	5-44
SERVO	5-17 /	5-39
SENSOR	5-19 /	5-38
SYS.CON./TIMER (For VT-F350A)	5-23 /	5-39
SYS.CON./TIMER (For VT-F351A,AW)	5-27 /	5-39
U-V TUNER	5-31 /	-

MAIN CIRCUIT BOARD DIAGRAM



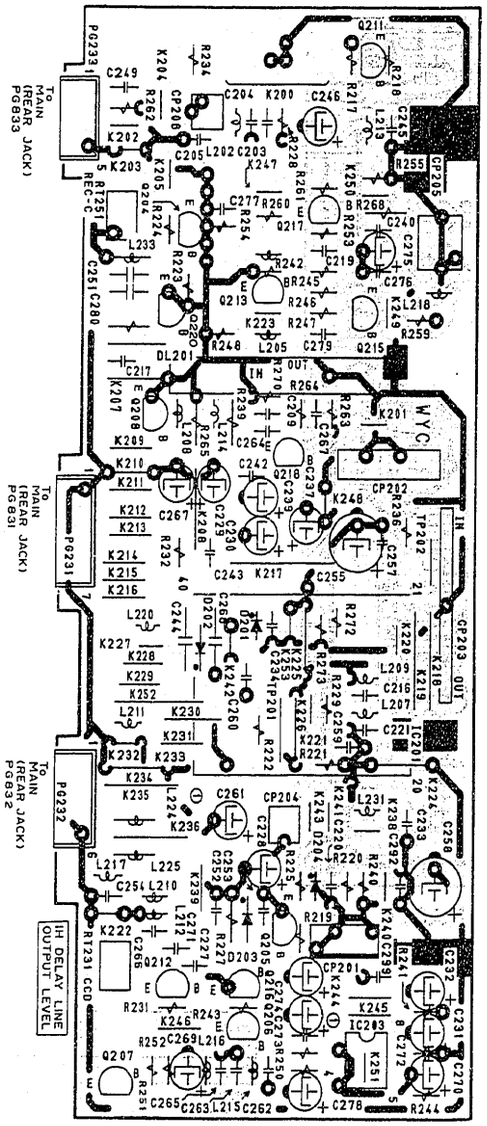
FUNCTION SW CIRCUIT BOARD DIAGRAM



FUNCTION SW (FSK) P.C.B

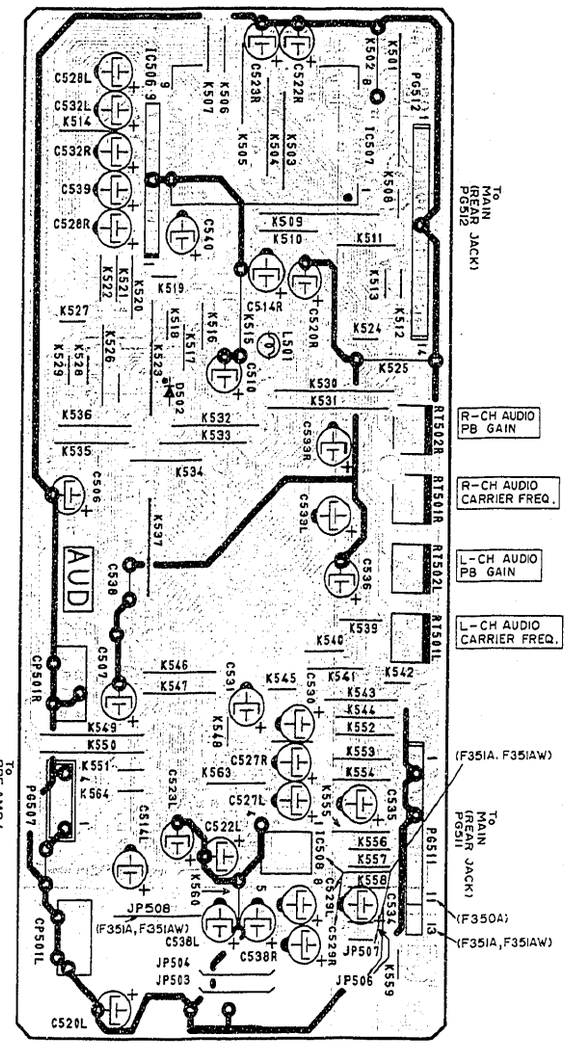
DIAGRAM CONFIGURATION	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
AUDIO	5-13 /	5-41
AUDIO-LINEAR	5-22 /	5-39
CAPSTAN MOTOR	5-15 /	-
CYL.MOTOR DRIVE	5-16 /	-
CHARACTER GENERATOR	5-21 /	5-39
FUNCTION SW	5-19 /	5-39
FRONT JACK (For VT-F351A,AW)	5-20 /	5-38
IF	5-12 /	-
LUMINANCE/CHROMA	5-9 /	5-41
PRE/REC AMP	5-33 /	-
POWER SUPPLY (For AW)	5-35 /	5-43
POWER SUPPLY (For A)	5-37 /	5-43
RF CONVERTER	5-20 /	-
REAR JACK (For VT-F350A)	5-25 /	5-39
REAR JACK (For VT-F351A,AW)	5-29 /	5-39
REGULATOR (For AW)	5-36 /	5-44
SERVO	5-17 /	5-39
SENSOR	5-19 /	5-38
SYS.CON./TIMER (For VT-F350A)	5-23 /	5-39
SYS.CON./TIMER (For VT-F351A,AW)	5-27 /	5-39
U-V TUNER	5-31 /	-

LUMINANCE/CHROMA CIRCUIT BOARD DIAGRAM

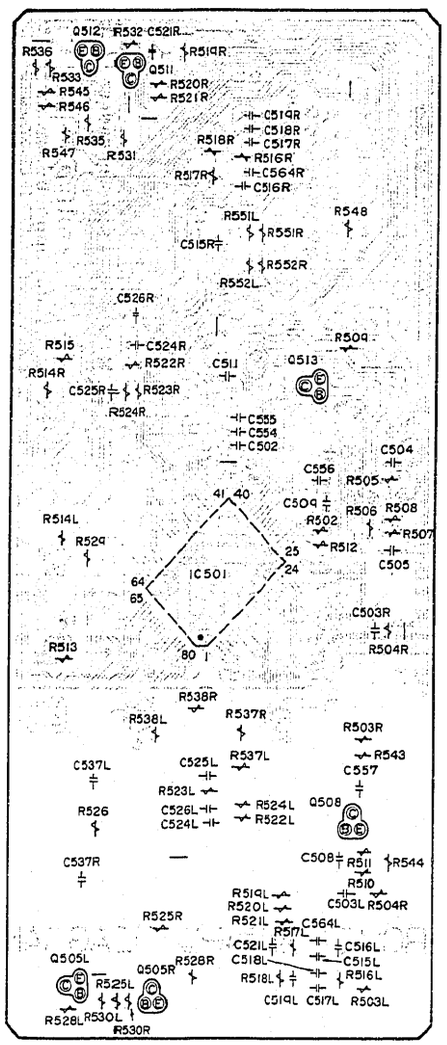


LUMINANCE /CHROMA(WYC) P.C.B

AUDIO CIRCUIT BOARD DIAGRAM



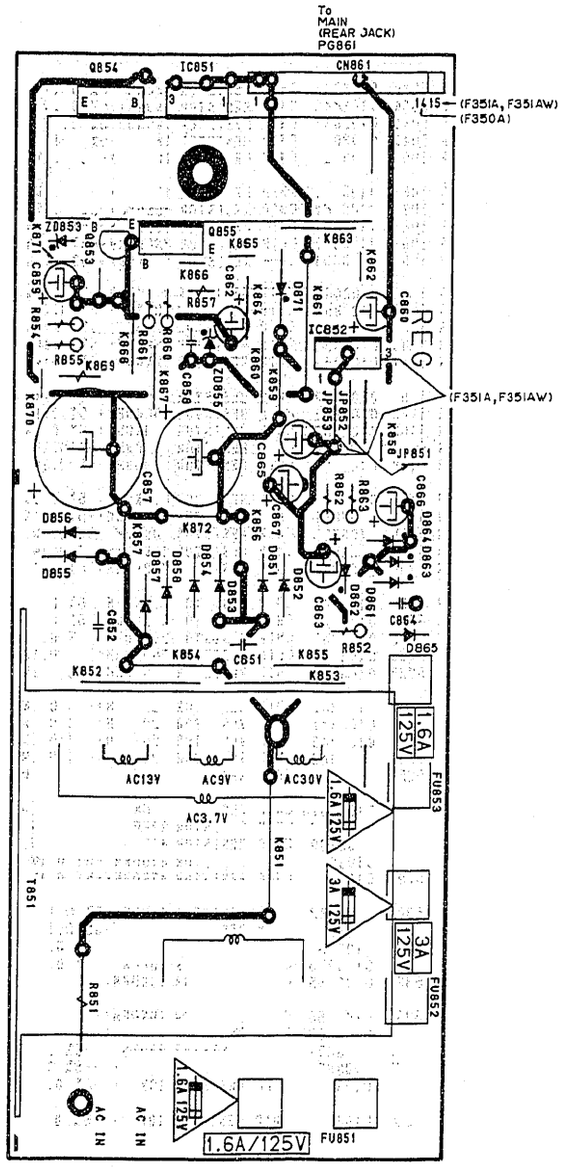
AUDIO (AUD) P.C.B
(COMPONENT SIDE)



AUDIO (AUD) P.C.B
(SOLDER SIDE)

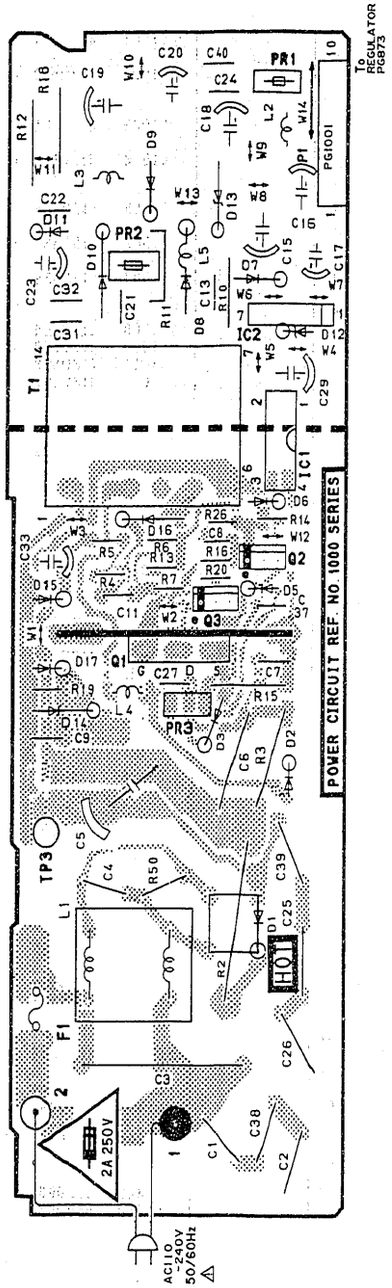
DIAGRAM CONFIGURATION	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
AUDIO	5-13 /	5-41
AUDIO-LINEAR	5-22 /	5-39
CAPSTAN MOTOR	5-15 /	-
CYL.MOTOR DRIVE	5-16 /	-
CHARACTER GENERATOR	5-21 /	5-39
FUNCTION SW	5-19 /	5-39
FRONT JACK (For VT-F351A,AW)	5-20 /	5-38
IF	5-12 /	-
LUMINANCE/CHROMA	5-9 /	5-41
PRE/REC AMP	5-33 /	-
POWER SUPPLY (For AW)	5-35 /	5-43
POWER SUPPLY (For A)	5-37 /	5-43
RF CONVERTER	5-27 /	-
REAR JACK (For VT-F350A)	5-25 /	5-39
REAR JACK (For VT-F351A,AW)	5-29 /	5-39
REGULATOR (For AW)	5-36 /	5-44
SERVO	5-17 /	5-39
SENSOR	5-19 /	5-38
SYS.CON./TIMER (For VT-F350A)	5-23 /	5-39
SYS.CON./TIMER (For VT-F351A,AW)	5-27 /	5-39
U-V TUNER	5-31 /	-

POWER SUPPLY CIRCUIT BOARD DIAGRAM (For A)



POWER SUPPLY (REG) P.C.B

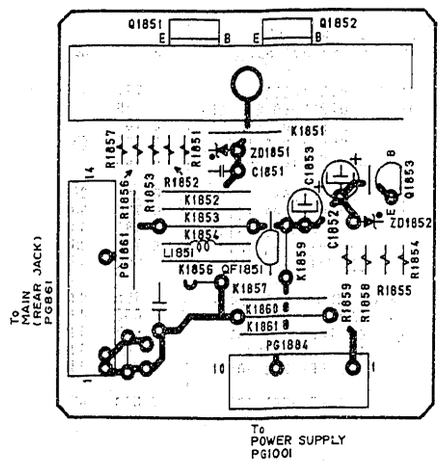
POWER SUPPLY CIRCUIT BOARD DIAGRAM (For AW)



POWER SUPPLY P.C.B (For AW)

DIAGRAM CONFIGURATION	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
AUDIO	5-13 /	5-41
AUDIO-LINEAR	5-22 /	5-39
CAPSTAN MOTOR	5-15 /	-
CYL.MOTOR DRIVE	5-16 /	-
CHARACTER GENERATOR	5-21 /	5-39
FUNCTION SW	5-19 /	5-39
FRONT JACK (For VT-F351A,AW)	5-20 /	5-38
IF	5-12 /	-
LUMINANCE/CHROMA	5-9 /	5-41
PRE/REC AMP	5-33 /	-
POWER SUPPLY (For AW)	5-35 /	5-43
POWER SUPPLY (For A)	5-37 /	5-43
RF CONVERTER	5-20 /	-
REAR JACK (For VT-F350A)	5-25 /	5-39
REAR JACK (For VT-F351A,AW)	5-29 /	5-39
REGULATOR (For AW)	5-36 /	5-44
SERVO	5-17 /	5-39
SENSOR	5-19 /	5-38
SYS.CON./TIMER (For VT-F350A)	5-23 /	5-39
SYS.CON./TIMER (For VT-F351A,AW)	5-27 /	5-39
U-V TUNER	5-31 /	-

REGULATOR CIRCUIT BOARD DIAGRAM (For AW)



REGULATOR (REG) P.C.B (For AW)

REPLACEMENT PARTS LIST

ELECTRICAL PARTS LIST

SYMBOL-No	P-No	DESCRIPTION
		CAPACITORS
C 203	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 204	0890012	CERAMIC DISC 18PF+-5% 50V
C 205	0890022	CERAMIC DISC 100PF+-10% 50V
C 207	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 209	0890011	CERAMIC DISC 15PF+-5% 50V
C 216	0890016	CERAMIC DISC 39PF+-50% 50V
C 217	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 219	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 220	0890023	CERAMIC DISC 120PF+-10% 50V
C 221	0890016	CERAMIC DISC 39PF+-50% 50V
C 227	0890038	CERAMIC DISC 3300PF+-20% 16V
C 233	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C 234	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 240	0890004	CERAMIC DISC 3.3PF+-10% 50V
C 242	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 243	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 244	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 245	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 249	0890031	CERAMIC DISC 470PF+-10% 50V
C 251	0890016	CERAMIC DISC 39PF+-50% 50V
C 252	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 253	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 254	0890017	CERAMIC DISC 47PF+-5% 50V
C 257	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 259	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 260	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 262	0890013	CERAMIC DISC 22PF+-5% 50V
C 263	0890021	CERAMIC DISC 82PF+-10% 50V
C 264	0890014	CERAMIC DISC 27PF+-50% 50V
C 265	0890013	CERAMIC DISC 22PF+-5% 50V
C 266	0890017	CERAMIC DISC 47PF+-5% 50V
C 268	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C 271	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C 272	0890035	CERAMIC DISC 1000PF 50V
C 273	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 276	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 277	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 279	0890018	CERAMIC DISC 56PF+-50% 50V
C 280	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 292	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 299	0890034	CERAMIC DISC 820PF+-10% 5V
C 405	0890042	CERAMIC DISC 8200PF+-20% 16V
C 410	0890029	CERAMIC DISC 390PF+-10% 50V
C 412	0890035	CERAMIC DISC 1000PF 50V
C 415	0890038	CERAMIC DISC 3300PF+-20% 16V (For F350A.F351A)
C 419	0890039	CERAMIC DISC 4700PF+-20% 16V
C 421	0890037	CERAMIC DISC 2200PF+-20% 16V
C 422	0204271	POLYESTER FILM 8200PF+-5% 100V
C 430	0890037	CERAMIC DISC 2200PF+-20% 16V
C 431	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 502	0201031	CERAMIC CHIP 100PF+-5% 50V
C 503L	0201007	CERAMIC CHIP 0.01UF+-20% 50V
C 503R	0201007	CERAMIC CHIP 0.01UF+-20% 50V
C 504	0201031	CERAMIC CHIP 100PF+-5% 50V
C 505	0201037	CERAMIC CHIP 330PF+-5% 50V
C 508	0201007	CERAMIC CHIP 0.01UF+-20% 50V
C 509	0201031	CERAMIC CHIP 100PF+-5% 50V
C 511	0201007	CERAMIC CHIP 0.01UF+-20% 50V
C 515L	0201054	CERAMIC CHIP 1000PF+-10% 50V
C 515R	0201054	CERAMIC CHIP 1000PF+-10% 50V
C 516L	0201054	CERAMIC CHIP 1000PF+-10% 50V
C 516R	0201054	CERAMIC CHIP 1000PF+-10% 50V
C 517L	0201054	CERAMIC CHIP 1000PF+-10% 50V
C 517R	0201054	CERAMIC CHIP 1000PF+-10% 50V
C 518L	0201059	CERAMIC CHIP 0.0033UF+-10% 50V
C 518R	0201059	CERAMIC CHIP 0.0033UF+-10% 50V
C 519L	0201007	CERAMIC CHIP 0.01UF+-20% 50V
C 519R	0201007	CERAMIC CHIP 0.01UF+-20% 50V
C 521L	0201065	CERAMIC CHIP 0.022UF+-10% 25V
C 521R	0201065	CERAMIC CHIP 0.022UF+-10% 25V
C 524L	0201065	CERAMIC CHIP 0.022UF+-10% 25V
C 524R	0201065	CERAMIC CHIP 0.022UF+-10% 25V
C 525L	0201062	CERAMIC CHIP 0.0068UF+-10% 50V
C 525R	0201062	CERAMIC CHIP 0.0068UF+-10% 50V
C 526L	0201056	CERAMIC CHIP 0.0015UF+-10% 50V
C 526R	0201056	CERAMIC CHIP 0.0015UF+-10% 50V
C 537L	0201056	CERAMIC CHIP 0.0015UF+-10% 50V
C 537R	0201056	CERAMIC CHIP 0.0015UF+-10% 50V
C 554	0201031	CERAMIC CHIP 100PF+-5% 50V
C 555	0201031	CERAMIC CHIP 100PF+-5% 50V
C 556	0201031	CERAMIC CHIP 100PF+-5% 50V
C 557	0201007	CERAMIC CHIP 0.01UF+-20% 50V
C 564L	0201061	CERAMIC CHIP 0.0047UF+-10% 50V
C 564R	0201061	CERAMIC CHIP 0.0047UF+-10% 50V
C 611	0890035	CERAMIC DISC 1000PF 50V
C 617	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 619	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C 621	0890026	CERAMIC DISC 220PF+-10% 50V
C 623	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C 624	0890024	CERAMIC DISC 150PF+-10% 50V
C 626	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 627	0890038	CERAMIC DISC 3300PF+-20% 16V
C 631	0890014	CERAMIC DISC 27PF+-50% 50V
C 759	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 761	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 762	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 763	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 769	0890118	CERAMIC DISC 22PF+-5% 50V
C 770	0890118	CERAMIC DISC 22PF+-5% 50V
C 772	0890102	CERAMIC DISC 0.022UF+80-20% 50V
C 774	0890035	CERAMIC DISC 1000PF+-10% 50V
C 776	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C 777	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C 779	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 781	0890022	CERAMIC DISC 100PF+-10% 50V
C 782	0890022	CERAMIC DISC 100PF+-10% 50V
C 784	0890027	CERAMIC DISC 270PF+-10% 50V
C 785	0890027	CERAMIC DISC 270PF+-10% 50V
C 786	0890103	CERAMIC DISC 47000PF+80-20% 12V
C 787	0890103	CERAMIC DISC 47000PF+80-20% 12V
C 790	0890022	CERAMIC DISC 100PF+-10% 50V
C 804	0890024	CERAMIC DISC 150PF+-10% 50V
C 805	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C 806	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 807	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 809	0890035	CERAMIC DISC 1000PF+-10% 50V
C 810	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C 814	0890035	CERAMIC DISC 1000PF+-10% 50V
C 816	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 817	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 819	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 820	0890043	CERAMIC DISC 0.01UF+-20% 16V
C 851	0890102	CERAMIC DISC 0.022UF+80-20% 50V
C 852	0890102	CERAMIC DISC 0.022UF+80-20% 50V
C 857	0256865	ELECTROLYTIC 3300UF 25V (For F350A.F351A)
C 858	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C 861	0256861	ELECTROLYTIC 2200UF 16V (For F350A.F351A)
⚠C1001	4130557	CERAMIC DISC 100PF 250V (For F351AW)
⚠C1002	4130557	CERAMIC DISC 100PF 250V (For F351AW)
C1003	4130572	CERAMIC DISC 0.22UF 250V (For F351AW)
C1004	4130567	CERAMIC DISC 3300PF 250V (For F351AW)
C1005	4130556	ELECTROLYTIC 82UF 400V (For F351AW)
C1006	4130565	MYLAR 0.47UF 400V (For F351AW)
C1007	4130559	CERAMIC DISC 220PF 1KV (For F351AW)
C1008	4130564	MYLAR 4700PF(For F351AW)
C1009	4130563	MYLAR 1000PF(For F351AW)
C1011	4130568	CERAMIC DISC 2.2PF (For F351AW)
C1013	4130562	CERAMIC DISC 1000PF(For F351AW)
C1015	4130554	ELECTROLYTIC 1000UF 18V (For F351AW)
C1016	7071802	ELECTROLYTIC 10UF 50V (For F351AW)
C1017	4130291	ELECTROLYTIC 330UF 18V (For F351AW)
C1018	7071802	ELECTROLYTIC 10UF 50V (For F351AW)
C1019	4130554	ELECTROLYTIC 1000UF 18V (For F351AW)
C1020	7071799	ELECTROLYTIC 1000UF 6.3V (For F351AW)
C1021	4130571	CERAMIC DISC 1000PF(For F351AW)
C1022	7071808	CERAMIC DISC 1000PF(For F351AW)
C1023	7071798	CARBON FILM 10 OHM(For F351AW)
C1024	4130561	CERAMIC DISC 0.01UF(For F351AW)
⚠C1025	4130566	MYLAR 0.01UF 250V (For F351AW)
⚠C1026	4130566	MYLAR 0.01UF 250V (For F351AW)
C1027	4130558	CERAMIC DISC 100PF 1KV (For F351AW)
C1029	4130288	ELECTROLYTIC 1UF 50V (For F351AW)
C1031	4130568	CERAMIC DISC 2.2PF (For F351AW)
C1032	4130568	CERAMIC DISC 2.2PF (For F351AW)
⚠C1033	4130555	ELECTROLYTIC 1UF 400V (For F351AW)
C1037	4130569	CERAMIC DISC 2200PF(For F351AW)
⚠C1038	4130557	CERAMIC DISC 100PF 250V (For F351AW)
⚠C1039	4130566	MYLAR 0.01UF 250V (For F351AW)
C1040	4130561	CERAMIC DISC 0.01UF(For F351AW)
C1402	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C1409	0890116	CERAMIC DISC 15PF+-5% 50V
C1410	0890115	CERAMIC DISC 12PF+-5% 50V
C1443	0890013	CERAMIC DISC 22PF+-5% 50V
C1446	0890038	CERAMIC DISC 3300PF+-20% 16V
C1448	0890031	CERAMIC DISC 470PF+-10% 50V
C1654	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C1803	0890073	CERAMIC DISC 82PF+-5% 50V
C1804	0890027	CERAMIC DISC 270PF+-10% 50V
C1805	0890028	CERAMIC DISC 330PF+-10% 50V
C1808	0890035	CERAMIC DISC 1000PF+-10% 50V
C1851	0890044	CERAMIC DISC 0.022UF+80-20% 25V (For F351AW)
		RESISTORS
R 502	01038483	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R 503L	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R 503R	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R 504L	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R 504R	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R 505	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 506	01038573	CHIP RESISTOR 15KOHM+-5% 0.1W
R 507	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R 508	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R 509	01038733	CHIP RESISTOR 330KOHM+-5% 0.1W
R 510	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R 511	0103854	CHIP RESISTOR 8.2KOHM+-5% 0.1W
R 512	01038563	CHIP RESISTOR 12KOHM+-5% 0.1W
R 513	0104124	CHIP RESISTOR 12KOHM+-1% 1/10W
R 514L	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 514R	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 515	0104123	CHIP RESISTOR 8.2KOHM+-1% 1/10W
R 516L	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R 516R	01038673	CHIP RESISTOR 100KOHM+-5% 0.1W
R 517L	0103858	CHIP RESISTOR 18KOHM+-5% 0.1W
R 517R	0103858	CHIP RESISTOR 18KOHM+-5% 0.1W
R 518L	0103852	CHIP RESISTOR 5.6KOHM+-5% 0.1W
R 518R	0103852	CHIP RESISTOR 5.6KOHM+-5% 0.1W
R 519L	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 519R	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 520L	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R 520R	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R 521L	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R 521R	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R 522L	0103840	CHIP RESISTOR 560 OHM+-5% 0.1W
R 522R	01038403	CHIP RESISTOR 560 OHM+-5% 0.1W
R 523L	0103842	CHIP RESISTOR 820 OHM+-5% 0.1W
R 523R	0103842	CHIP RESISTOR 820 OHM+-5% 0.1W
R 524L	0103842	CHIP RESISTOR 820 OHM+-5% 0.1W
R 524R	01038423	CHIP RESISTOR 820 OHM+-5% 0.1W
R 525L	0103852	CHIP RESISTOR 5.6KOHM+-5% 0.1W
R 525R	01038523	CHIP RESISTOR 5.6KOHM+-5% 0.1W
R 526	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R 528L	0103839	CHIP RESISTOR 4700HM+-5% 0.1W
R 528R	01038393	CHIP RESISTOR 4700HM+-5% 0.1W
R 529	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R 530L	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R 530R	01038433	CHIP RESISTOR 1KOHM+-5% 0.1W
R 531	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 532	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 533	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 535	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R 536	01038633	CHIP RESISTOR 47KOHM+-5% 0.1W
R 537L	0103871	CHIP RESISTOR 220KOHM+-5% 0.1W
R 537R	01038713	CHIP RESISTOR 220KOHM+-5% 0.1W
R 538L	0103858	CHIP RESISTOR 18KOHM+-5% 0.1W
R 538R	0103858	CHIP RESISTOR 18KOHM+-5% 0.1W
R 543	01038593	CHIP RESISTOR 22KOHM+-5% 0.1W
R 544	01038473	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R 545	0103858	CHIP RESISTOR 18KOHM+-5% 0.1W
R 546	01038543	CHIP RESISTOR 8.2KOHM+-5% 0.1W
R 547	01038553	CHIP RESISTOR 10KOHM+-5% 0.1W
R 548	01038383	CHIP RESISTOR 390 OHM+-5% 0.1W
R 551L	0103858	CHIP RESISTOR 18KOHM+-5% 0.1W
R 551R	01038583	CHIP RESISTOR 18KOHM+-5% 0.1W
R 552L	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W

SYMBOL-No	P-No	DESCRIPTION
R 552R	01038623	CHIP RESISTOR 39KOHM+-5% 0.1W
R 705	0101765	CHIP RESISTOR 10KOHM+-1% 1/8W
R 708	0170471	3FUSE RESISTOR 2.2OHM+-5% 1/4W
⚠R 852	0170477	FUSE RESISTOR 8.2OHM+-5% 1/4W (For F350A.F351A)
RT 231	5030084	TRIMMER 1KOHM
RT 251	5030085	TRIMMER 2.2KOHM
RT 401	5030012	SEMI VARIABLE 220KOHM
RT 501L	5035077	SEMI VARIABLE 10KOHM
RT 501R	5035077	SEMI VARIABLE 10KOHM
RT 502L	5006239	SEMI VARIABLE 47KOHM
RT 502R	5006239	SEMI VARIABLE 47KOHM
RT 601	5030012	SEMI VARIABLE 220KOHM
RT1801	5030008	SEMI VARIABLE 22KOHM
⚠R1002	4130547	CARBON FILM 2.2 OHM 2W (For F351AW)
⚠R1003	4130553	METAL FILM 330KOHM 2W (For F351AW)
R1004	7071795	METAL FILM 120KOHM(For F351AW)
R1005	7071795	METAL FILM 120KOHM(For F351AW)
R1006	4130549	METAL OXIDE 33 OHM (For F351AW)
R1007	4130545	CARBON FILM 22KOHM (For F351AW)
⚠R1010	4130551	FUSE RESISTOR 10 OHM (For F351AW)
⚠R1011	7071789	COIL 10 OHM (For F351AW)
⚠R1012	4130283	FUSE RESISTOR 2.7 OHM(For F351AW)
R1013	4130548	CARBON FILM 100 OHM(For F351AW)
R1014	4130542	CARBON FILM 12KOHM (For F351AW)
⚠R1015	4130552	METAL FILM 0.56 OHM 1W (For F351AW)
R1016	4130544	CARBON FILM 22 OHM (For F351AW)
R1018	4130285	METAL FILM 0.1 OHM 1W (For F351AW)
R1019	4130546	CARBON FILM 27KOHM (For F351AW)
⚠R1020	4130541	CARBON FILM 1KOHM (For F351AW)
R1026	4130543	CARBON FILM 1 OHM (For F351AW)
R1443	0101736	METAL FILM 120KOHM 1/8W
R1454	0101765	CHIP RESISTOR 10KOHM+-1% 1/8W

SEMI-CONDUCTORS

D 141	5380933	LED GL-451
D 201	5339131	DIODE 1SS254
D 202	5339131	DIODE 1SS254
D 203	5339131	DIODE 1SS254
D 204	5339131	DIODE 1SS254
D 502	5339131	DIODE 1SS254
D 751	5339381	DIODE ERA81-004
D 756	5339491	DIODE 1N4531
D 757	5339491	DIODE 1N4531 (For F351A.AW)
D 761	5339491	DIODE 1N4531
D 763	5339491	DIODE 1N4531 (For F351AW)
D 764	5339491	DIODE 1N4531
D 765	5339491	DIODE 1N4531
D 766	5339491	DIODE 1N4531
D 768	5339491	DIODE 1N4531
D 770	5339231	DIODE 1SR35-100A
D 771	5339231	DIODE 1SR35-100A
D 772	5339491	DIODE 1N4531 (For F351A.AW)
D 773	5339491	DIODE 1N4531 (For F351A.AW)
D 774	5339491	DIODE 1N4531 (For F351A.AW)
D 801	5339381	DIODE ERA81-004
D 802	5339491	DIODE 1N4531
D 803	5339491	DIODE 1N4531
D 804	5339491	DIODE 1N4531
D 805	5339381	DIODE ERA81-004 (For F350A.F351A)
D 821	5339491	DIODE 1N4531
D 822	5339491	DIODE 1N4531
⚠D 851	5339231	DIODE 1SR35-100A (For F350A.F351A)
⚠D 852	5339231	DIODE 1SR35-100A (For F350A.F351A)
⚠D 853	5339231	DIODE 1SR35-100A (For F350A.F351A)
⚠D 854	5339231	DIODE 1SR35-100A (For F350A.F351A)
⚠D 855	5339231	DIODE 1SR35-100A (For F350A.F351A)
⚠D 856	5339231	DIODE 1SR35-100A (For F350A.F351A)
⚠D 857	5339231	DIODE 1SR35-100A (For F350A.F351A)
⚠D 858	5339231	DIODE 1SR35-100A (For F350A.F351A)
D 861	5339171	DIODE 1SS130(For F350A.F351A)
D 862	5339171	DIODE 1SS130(For F350A.F351A)
D 863	5339171	DIODE 1SS130(For F350A.F351A)
D 864	5339171	DIODE 1SS130(For F350A.F351A)
D 865	5339171	DIODE 1SS130(For F350A.F351A)
D 871	5339131	DIODE 1SS254(For F350A.F351A)
⚠D1001	5382491	DIODE S1WBA60Z (For F351AW)
D1002	5382461	DIODE ERA34-10 (For F351AW)
D1003	5382471	DIODE ERB12-01 (For F351AW)
D1005	5382301	DIODE MA858-TA5(For F351AW)
D1006	5336991	DIODE MA165 (For F351AW)
⚠D1007	5336322	DIODE EG01 (For F351AW)
⚠D1008	5382481	DIODE ERC81-006(For F351AW)
⚠D1009	5336322	DIODE EG01 (For F351AW)
⚠D1010	5331431	DIODE ERB81-004(For F351AW)
⚠D1011	5382341	DIODE MA178 (For F351AW)
D1012	5336981	DIODE MA4051N-M(For F351AW)
D1013	5336811	DIODE MA2180 (For F351AW)
D1014	5336811	DIODE MA2180 (For F351AW)
D1015	5382451	DIODE ERA15-04 (For F351AW)
D1016	5382501	DIODE MA2100 (For F351AW)
D1017	5382341	DIODE MA178 (For F351AW)
D1421	5339131	DIODE 1SS254
D1422	5339131	DIODE 1SS254
D1423	5339131	DIODE 1SS254
D1751	5339131	DIODE 1SS254 (For F351A.AW)
D1752	5339131	DIODE 1SS254 (For F351A.AW)
D1801	5339491	DIODE 1N4531
D1802	5339491	DIODE 1N4531
IC 141	5391282	IC DN6851 (For F350A.F351A)
IC 142	5391282	IC DN6851 (For F351A)
IC 201	1373661	IC HT7213 (For F351AW)
IC 201	1373066	IC HT7233E(For F350A.F351A)
IC 203	1362261	IC CXL5507P
IC 401	1341493	IC XRA7767AS
IC 501	1351503	IC XRA7703K1-VP
IC 506	1361711	IC LVA521S-2
IC 507	1381181	PWB ASSY AUDIO MPX
IC 508	5350607	IC RC4558D (For F351A.AW)
IC 601	1360042	IC HD49741A
IC 751	1355648	IC M38174M8-107FP
IC 753	5300795	IC XRA6209U
IC 754	1340002	IC S-8053ALB
IC 811	1342031	IC NJM2248S
IC 851	1341511	IC M5F7805L (For F350A.F351A)
IC 852	1341511	IC M5F7805L (For F351A)
IC1001	5390471	DIODE ERB12-01 (For F351AW)

SYMBOL-No	P-No	DESCRIPTION
IC1002	1388691	IC VCRSO124 (For F351AW)
IC1401	1352475	IC M50458-084FP
IC1441	1361932	IC BA7046A
IC1651	1360072	IC XRA6459P1
IC1751	1388711	PWB ASSY SBX1644
Q 141	5324661	TRANSISTOR PT-483F1
Q 204	5327063	TRANSISTOR 2SC1740S
Q 205	5327075	TRANSISTOR XDC144ES
Q 206	5327021	TRANSISTOR 2SA844CD
Q 207	5327063	TRANSISTOR 2SC1740S
Q 208	5327075	TRANSISTOR XDC144ES
Q 211	5327063	TRANSISTOR 2SC1740S
Q 212	5327075	TRANSISTOR XDC144ES
Q 213	5327021	TRANSISTOR 2SA844CD
Q 215	5327063	TRANSISTOR 2SC1740S
Q 216	5327075	TRANSISTOR XDC144ES
Q 217	5327063	TRANSISTOR 2SC1740S
Q 218	5327063	TRANSISTOR 2SC1740S
Q 220	5327075	TRANSISTOR XDC144ES
Q 404	5327075	TRANSISTOR XDC144ES
Q 405	5327091	TRANSISTOR 2SD1504E
Q 406	5327101	TRANSISTOR 2SC3553
Q 505L	5328721	TRANSISTOR 2SD1328
Q 505R	5328721	TRANSISTOR 2SD1328
Q 508	5329972	TRANSISTOR 2SC2412K-BRT
Q 511	5328796	TRANSISTOR XDC144EK
Q 512	5328796	TRANSISTOR XDC144EK
Q 513	5328797	TRANSISTOR XDA144EK
Q 603	5327063	TRANSISTOR 2SC1740S
Q 752	5324631	TRANSISTOR 2SA1390C (For F350A.F351A)
Q 753	5327073	TRANSISTOR DTC144ES
Q 755	5327073	TRANSISTOR DTC144ES
Q 756	5327073	TRANSISTOR DTC144ES (For F350A.F351A)
Q 801	5327021	TRANSISTOR 2SA844CD
Q 802	5327031	TRANSISTOR 2SA673C
Q 821	5327031	TRANSISTOR 2SA673C
Q 822	5327075	TRANSISTOR XDC144ES
Q 823	5327031	TRANSISTOR 2SA673C
Q 824	5327075	TRANSISTOR XDC144ES
Q 825	1320004	TRANSISTOR 2SA854SQR
Q 826	5327063	TRANSISTOR 2SC1740S
Q 853	5327075	TRANSISTOR XDC144ES (For F350A.F351A)
Q 854	1321341	TRANSISTOR 2SD1765 (For F350A.F351A)
Q 855	1321341	TRANSISTOR 2SD1765 (For F350A.F351A)
⚠Q1001	1322181	TRANSISTOR 2SK796(For F351AW)
⚠Q1002	1321921	TRANSISTOR 2SD636(For F351AW)
⚠Q1003	1322171	TRANSISTOR 2SB1050(For F351AW)
Q1421	5327063	TRANSISTOR 2SC1740S
Q1422	5327063	TRANSISTOR 2SC1740S
Q1423	5327063	TRANSISTOR 2SC1740S
Q1424	5327063	TRANSISTOR 2SC1740S
Q1431	5327063	TRANSISTOR 2SC1740S
Q1432	5327063	TRANSISTOR 2SC1740S
Q1433	1320012	TRANSISTOR 2SA933S(R)
Q1434	5327075	TRANSISTOR XDC144ES
Q1435	5327075	TRANSISTOR XDC144ES
Q1443	5327063	TRANSISTOR 2SC1740S
Q1802	5327063	TRANSISTOR 2SC1740S
Q1851	1321341	TRANISITOR 2SD1765(For F351AW)
Q1852	1321341	TRANISITOR 2SD1765(For F351AW)
Q1853	5327075	TRANSISTOR XDC144ES (For F351AW)
PR1001	5721807	IC PROTECTOR (For F351AW)
PR1002	4130577	IC PROTECTOR (For F351AW)
PR1003	5721807	IC PROTECTOR (For F351AW)
QF 801	5721943	IC PROTECTOR
QF 802	5721802	IC PROTECTER
ZD 751	5339263	ZENER DIODE HZS7-A1
ZD 752	5339277	ZENER DIODE HZS6A2
ZD 753	5339281	ZENER DIODE HZS11-A2
ZD 754	5339287	ZENER DIODE HZS9A3
ZD 755	5339471	ZENER DIODE HZS24-3 (For F350A.F351A)
ZD 757	5339299	ZENER DIODE HZS5B1 (For F350A.F351A)
ZD 853	5339268	ZENER DIODE HZS11B2 (For F350A.F351A)
ZD 855	5339255	ZENER DIODE HZS12C-3T (For F350A.F351A)
ZD1801	53392883	ZENER DIODE HZS30-3
ZD1851	5339255	ZENER DIODE HZS12-C3T (For F351AW)
ZD1852	5339268	ZENER DIODE HZS11B2 (For F351AW)

TRANSFORMERS

T 401	5262545	OSCILLATOR,BIAS
⚠T 851	5214192	TRANSFORMER,POWER(For F350A)
⚠T 851	5214194	TRANSFORMER,POWER(For F351A)
⚠T1001	4130575	TRANSFORMER (For F351AW)

COILS

L 202	5159145	CHOKE COIL 22UH
L 205	5159147	CHOKE COIL 33UH
L 207	5159141	CHOKE COIL 10UH
L 208	5159152	CHOKE COIL 68UH
L 209	5159147	CHOKE COIL 33UH
L 210	5159149	CHOKE COIL 47UH
L 211	5159077	CHOKE COIL 100UH+-10%
L 212	5159141	CHOKE COIL 10UH
L 213	5159077	CHOKE COIL 100UH+-10%
L 214	5121184	COIL 100UH
L 215	5159152	CHOKE COIL 68UH
L 216	5159152	CHOKE COIL 68UH
L 217	5159077	CHOKE COIL 100UH+-10%
L 218	5159077	CHOKE COIL 100UH+-10%
L 220	5159077	CHOKE COIL 100UH+-10%
L 221	5159089	CHOKE COIL 820UH+-10%
L 223	5159149	CHOKE COIL 47UH
L 224	5159158	CHOKE COIL 220UH
L 225	5159158	CHOKE COIL 220UH
L 401	5159077	CHOKE COIL 100UH+-10%
L 402	5159111	CHOKE COIL 5600UH
L 501	5159077	CHOKE COIL 100UH+-10%
L 801	5159077	CHOKE COIL 100UH+-10%
L 802	5159077	CHOKE COIL 100UH+-10%
L 804	5159068	CHOKE COIL 220UH+-10% (For F350A.F351A)
L 805	5159077	CHOKE COIL 100UH+-10%
⚠L1001	7071819	COIL (For F351AW)
L1002	7071822	COIL (For F351AW)
L1003	7071822	COIL (For F351AW)
L1004	4130573	COIL (For F351AW)
L1005	4130574	COIL (For F351AW)

SYMBOL-No	P-No	DESCRIPTION
L1402	5159077	CHOKE COIL 100UH+-10%
L1403	5159077	CHOKE COIL 100UH+-10%
L1751	5159077	CHOKE COIL 100UH+-10% (For F351A.AW)
L1801	5159068	CHOKE COIL 22UH+-10%
L1802	5159077	CHOKE COIL 100UH+-10%
L1811	5159133	COIL.CHOKE 2.2UH+-20%
L1851	5159154	CHOKE COIL 100UH(For F351AW)
		CRYSTALS
X 751	5784478	OSCILLATOR
X 752	5783001	CRYSTAL
X1401	5781793	OSCILLATOR
		MISCELLANEOUS
BL 602	5272376	FILTER
CP 201	5164733	LOW PASS FILTER
CP 202	5165121	BAND PASS FILTER
CP 203	5165053	LC FILTER
CP 204	5165095	COIL,TRAP
CP 205	5163591	BAND PASS FILTER
CP 208	5162754	HIGHT PASS FILTER
CP 501L	5163101	BAND PASS FILTER
CP 501R	5163102	BAND PASS FILTER
CP1401	5163375	FILTER,LOW PASS

SYMBOL-No	P-No	DESCRIPTION
DG 751	5315321	FLUORESCENT INDICATOR TUBE
DL 201	5786331	DELAY LINE
⚠F1001	4130576	FUSE 2A (For F351AW)
JK1751	5674611	JACK (For F351A.AW)
LV1752	5317223	METER.LEVEL (For F351A)
LV1752	5317221	METER.LEVEL (For F351AW)
⚠FU 851	5722651	FUSE 1.6A (For F350A)
⚠FU 851	5721405	FUSE 1.6A (For F351A)
⚠FU 852	5721983	FUSE 3A (For F350A.F351A)
⚠FU 853	5722651	FUSE 1.6A (For F350A)
⚠FU 853	5721405	FUSE 1.6A (For F351A)
S 141	5635321	SWITCH
S 142	5635331	SWITCH
S1755	5634884	SWITCH
S1756	5634884	SWITCH
S1757	5634884	SWITCH
S1758	5634884	SWITCH
S1759	5634884	SWITCH
S1760	5634884	SWITCH
S1761	5634884	SWITCH
S1762	5634884	SWITCH
S1763	5634884	SWITCH
S1771	5634884	SWITCH

MECHANICAL PARTS LIST

SYMBOL-No	P-No	DESCRIPTION
		FOR FINAL ASSEMBLY
101	6007295	COVER,TOP
102	6007301	COVER,BOTTOM
103	4721193	PANEL.FRONT (For F350A)
103	4721192	PANEL.FRONT (For F351A.F351AW)
104	6489116	DOOR,CASSETTE
106	6443572	INSULATOR
107	6527402	SPRING,DOOR
108	4742642	DOOR,BUTTON
⚠111	5850753	CORD.POWER (For F350A.F351A)
⚠111	7071833	CORD.POWER (For F351AW)
112	6810443	STOPPER,DOOR
113	4330231	FILT
115	4721201	PANEL,REAR
118	5582144	TUNER UNIT
119	5583824	IF BLOCK
120	5589332	RF CONVERTER
123	5885985	CABLE
126	6551851	SPRING,DOOR.
127	4897131	PLATE
128	6802271	BRACKET
129	6528932	PLATE
130	6714211	NYLON RIVET - 3MMD
131	4898261	PLATE
132	6816171	BRACKET (For F351AW)
133	4898261	PLATE
135	4722443	DOOR.CONTROL (For F350A)
135	4722442	DOOR.CONTROL (For F351A.AW)
202	6915922	SCREW

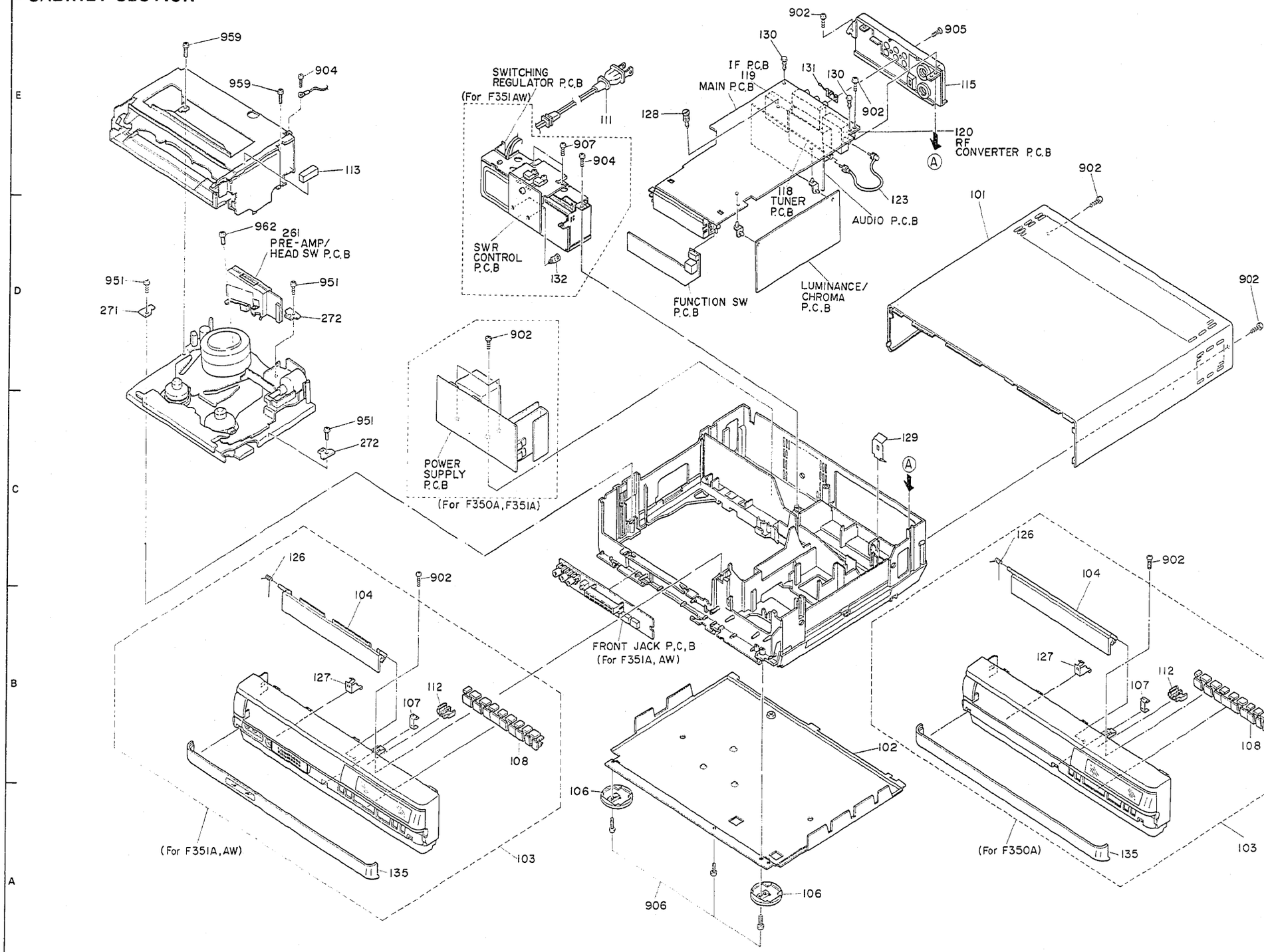
SYMBOL-No	P-No	DESCRIPTION
203	7469871	BASE
204	5434061	HEAD
205	6304906	SPRING
206	6522752	SPRING
207	7785673	NUT
208	6896914	BRAKE
209	6555501	SPRING
210	6416122	REEL TABLE.SUPPLY
211	7789123	POLYSLIDER WASHER
212	6416131	REEL TABLE,TAKE UP
213	7789122	POLYSLIDER WASHER
214	6975766	ARM,PRESSER ROLLER
215	6804273	BLOCK,SLIDER
216	7412822	PLATE
217	7429651	GEAR,LOADING(L)
218	7429661	GEAR,LOADING(R)
219	6911551	GUIDE ROLLER BASE(IN)
220	6424261	ROLLER,GUIDE
221	69115733	BASE,GUIDE ROLLER (OUT)
222	6911004	BASE
223	5445851	HEAD FULL ERASE
225	4508237	GUIDE,TAPE
226	6555431	SPRING
227	7413665	HOLDER-BAND
228	7412863	ARM
229	6555446	SPRING
230	6897265	BRACKET
231	6896752	ARM
232	6555061	SPRING
233	6897473	ARM,IMPEDANCE

SYMBOL-No	P-No	DESCRIPTION
235	7468854	LOADING BLOCK
236	7398631	BRACKET
237	7412881	ARM
238	6976551	ARM
239	7412893	ARM
240	7428072	ARM OPERATION
241	6896903	BRAKE
242	6551151	SPRING
243	6804792	BRAKE
244	6896895	HOLDER,MOTOR
245	6896852	ARM
246	6897251	ARM
247	6555483	SPRING
248	6897271	ARM
249	6897066	GEAR,MODE
250	6434861	WORM WHEEL
251	6555052	SPRING
252	7799012	WASHER
255	4508235	GUIDE
257	6976372	ARM
258	7786623	POLYSLIDER WASHER
259	6898472	ARM,IDLE
261	1390351	PWB ASSY PRE-AMP
268	7472092	BRACKET
271	7429631	BRACKET
272	7429641	BRACKET
273	7472125	ARM
275	7788348	WASHER
276	6806622	BRAKE
277	6555061	SPRING
301	5571475	MOTOR,CAPSTAN
302	6804834	BASE
303	6351555	BELT
304	6897095	ARM,FF/REW
305	6434852	RACK
402	6804982	BRACKET
403	6804962	BRACKET
404	6896971	WORM WHEEL ASSY
405	6435571	WORM
406	4508221	WORM SHAFT
407	6804992	BRACKET
408	6896632	ARM-SWITCH
409	6302474	SPRING
410	6897041	ARM-SWITCH
411	7412583	BRACKET-GEAR
412	7449178	HOLDER
413	7449164	BASE,CASSETTE HOLDER
414	6896664	HOLDER,CASSETTE (R)
415	7428113	HOLDER,STAY
416	6820361	ARM

SYMBOL-No	P-No	DESCRIPTION
417	6897001	ARM
418	6556241	SPRING
419	6896673	HOLDER,CASSETTE (L)
420	7412944	ARM
421	6555772	SPRING
422	7412953	SPRING
423	6806531	HOLDER,FRONT
424	7580791	SHAFT ASSY
425	7428982	BRACKET
426	7794391	WASHER
501	5436468	CYLINDER ASSY (CY-Z6N3)
502	5571603	MOTOR,CYLINDER
503	5792635	BRUSH,CYLINDER
902	8699412	SCREW (3X12) BLACK
904	86914063	3X6 BT BIND SCREW
905	7781582	FALT SCREW-3MMDX10MM (BLACK)
906	8699414	SCREW(3X14)
907	8691408	SCREW(3X8) (For F351AW)
951	8691410	SCREW
952	8691308	SCREW BT2.6MMDX8MM
953	8699408	SCREW
954	7781872	SCREW-3MMDX8MM
955	7773086	SCREW
956	8741414	SCREW (3X14)
957	8691412	SCREW (3X12)
958	8691408	SCREW (3X8)
959	8711406	SCREW - 3X6 PAN HEAD SCREW
960	8741412	SCREW (B3X12)
961	7785941	SCREW
962	87114043	SCREW - 3X4 PAN HEAD SCREW
963	7775581	SCREW(M3X14)
965	8741408	SCREW (B3X8)
998	7784131	SCREW(3X8)
999	8711405	SCREW(3X5)

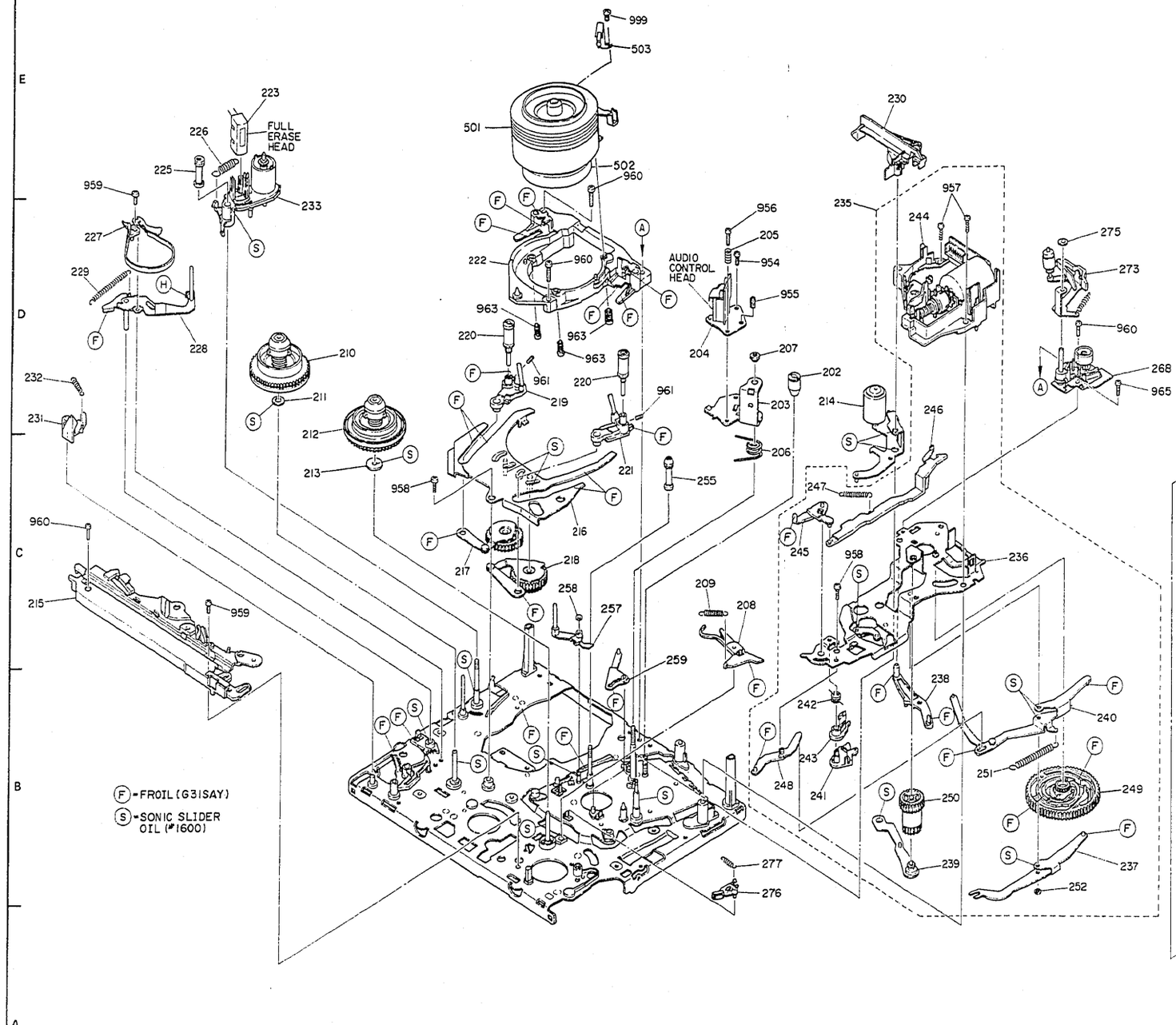
P-No	DESCRIPTION
	FOR ACCESSARIES
5614895	REMOTE HAND SET (For F350A)
5614883	REMOTE HAND SET (For F351A)
5614896	REMOTE HAND SET (For F351AW)
5858583	CABLE
5662611	SEIMENS PLUG (For F351AW)

EXPLODED VIEWS
CABINET SECTION

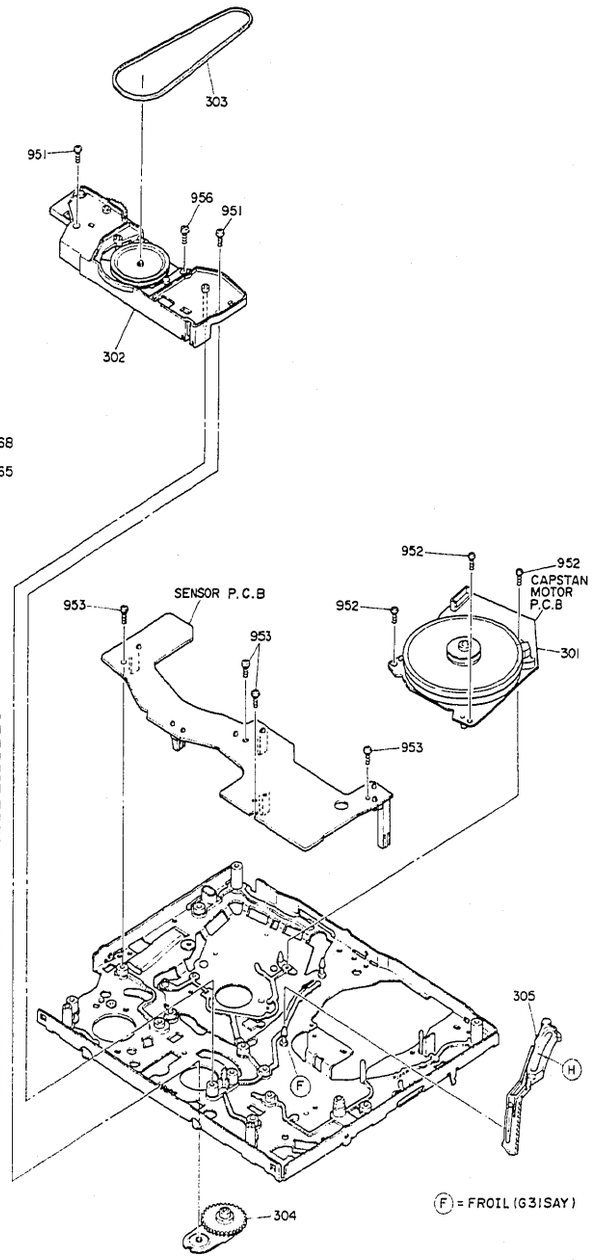


1 2 3 4 5 6 7 8

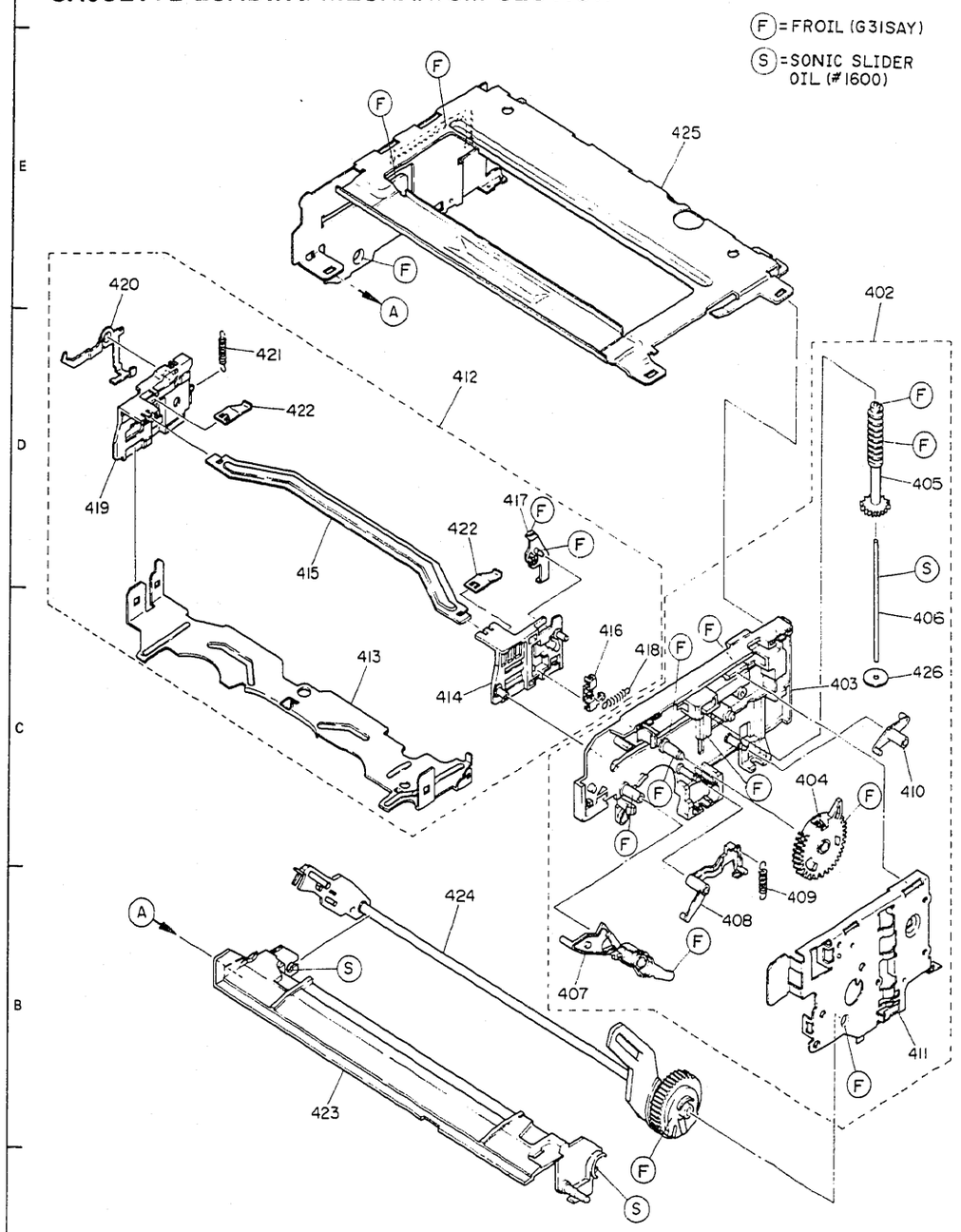
CHASSIS (I) SECTION



CHASSIS (II) SECTION



CASSETTE LOADING MECHANISM SECTION



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